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ABSTRACT

At a national institute held August 18-29, 1969, 90 individuals met to discuss the development of programs of short-term teacher education for health specialists who were needed to instruct supportive-level health workers. This publication contains revised guidelines and presentations made at the institute and is intended to aid participants and other interested persons as they work to increase the availability of teacher education activities for health occupations education personnel. It is divided into six modular units which can be used independently of each other. The subjects of the units are Supportive Personnel in the Changing Health Industry, Defining and Describing the Educational Product, The Learner and Learning, Designing Learning Programs, Evaluation in the Educational Process, and The Educational Process. Guidelines and supportive papers are presented for each modular unit. (BC)

# Guidelines and Supportive Papers for Planning and Conducting Short-term Teacher Education Activities

The University of Iowa Iowa City, Iowa

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# GUIDELINES AND SUPPORTIVE PAPERS FOR PLANNING AND CONDUCTING SHORT-TERM TEACHER EDUCATION ACTIVITIES

## Developing Teaching Competencies Needed by Educational Personnel in Post-Secondary Health Occupations Programs

Edited by

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Iowa City, Iowa

February 1970

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

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HEALTH, EDUCATION, AND WELFARE

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TABLE OF CONTENTS


INTRODUCTION . . . . . iv

FOREWORD . . . . . vi

INSTITUTE STAFF AND CONSULTANT-PRESENTERS . . . . . viii

MODULAR UNIT 1 Supportive Personnel in the Changing Health Industry . . . . . 1

Guidelines . . . . . 2
Supportive Papers 13

MODULAR UNIT 2 Defining and Describing the Educational Product . . . . . 51

Guidelines . . . . . 52
Supportive Papers . . . . . 59

MODULAR UNIT 3 The Learner and Learning . . . . . 97

Guidelines . . . . . 98
Supportive Papers . . . . . 117

MODULAR UNIT 4 Designing Learning Programs . . . . . 149

Guidelines . . . . . 150
Supportive Papers . . . . . 164

MODULAR UNIT 5 Evaluation in the Educational Process . . . . . 197

Guidelines . . . . . 198
Supportive Papers . . . . . 213

MODULAR UNIT 6 The Educational Process . . . . . 249

Guidelines . . . . . 250
Supportive Papers . . . . . 254

# INTRODUCTION

Increasing demands for more and better health care have caused a rapid expansion in programs to prepare supportive-level health workers. To staff these programs, individuals prepared in the health specialties who have successful experience in their fields are being asked to switch from providing health services to teaching. Rarely have these specialists had specific preparation for their teaching role. The purpose of U.S. Office of Education Project No. 9-0340, entitled Developing Teaching Competencies Needed by Educational Personnel in Post-Secondary Health Occupations Programs, is to increase the availability of pre-service and in-service teacher education activities for health occupations education personnel.

For this project guidelines were developed for planning and conducting short-term teacher education activities based upon the knowledge and experience that project staff members had gained from searching the literature, reviewing research studies and through their previous involvement in teacher education. A national institute was held (August 18-29, 1969) which brought together 90 individuals who had some potential to conduct, or to stimulate others to conduct, short-term teacher education activities. In addition to preparing the participants for their role in teacher education, the Institute provided a means by which the staff was able to evaluate the guidelines. This publication, which contains the revised guidelines and the presentations made at the Institute, is designed to serve the Institute participants, and other interested individuals, as they work to increase the availability of teacher education activities for health occupations education personnel.

The editor is aware that further refinement of these guidelines and papers could have been achieved by having them reviewed by those competent in this field and through pilot projects. It was also felt that there is a great need to get these materials into the hands of individuals who might use them as soon as possible. The immediate need is being attended to at the expense of a more highly polished product. At the request of the Institute participants' advisory committee the supportive papers have been left with much of the "flavor" of the original presentations rather than to have the presenters rewrite them into more scholarly papers.

A description of the Institute, an evaluation of it and the results of follow-up activities will be included in the final report of the project which will be published late in 1970.

Sincere appreciation is extended to each of the staff members and the consultant, presenters who were a part of the Institute and to those who assisted in the development and revision of the materials included in this publication. Special recognition is due Robert M. Tomlinson for his contribution as co-director of the project. Gratitude is also extended to Larry J. Bailey, Assistant Project Director, who prepared the annotated bibliographies and assisted with developing other materials. Finally, a special thank-you to the wonderful group of participants who contributed so much to the success of the Institute.

L.D.H.

## FOREWORD

In planning the format for this document and in developing the materials enclosed, the need for flexibility was given high priority. Although the guidelines and papers included were designed for a two-week institute, and although it is felt that pre-service activities of about this length are advantageous for new teachers, consideration was given to the need for a wide variety of teacher education activities. The enclosed guidelines should not be thought of as a "cookbook" which provides step-by-step procedures. A great many variables, e.g., the nature of the participant group, time limitations, environment, institutional needs and the availability of funds, all go together to determine the specific type of activity which should be developed. The purpose of this publication is to provide a starting point, a first step, toward increasing the availability of teacher education offerings for health occupations education personnel.

This document is made up of six modular units. Although there are themes which run across all, or between two, modules; it is felt that they can also be used independently. The type of binding used will allow the publication to be disassembled into six separate units, if this is desired.

The materials provided for each modular unit do not constitute inclusive coverage of the topic areas. Each area could easily have been planned a full year course without exhausting the field of study. The guidelines represent a synthesis of what the Institute staff felt was appropriate for short-term teacher education activities. Another limitation which the reader would do well to remember is that the supportive papers included with each modular unit do not necessarily fully cover the topics specified or the objectives given. Some of the presenters were somewhat more removed from the development of the guidelines than others. It was the view of the staff that each presenter should have the objectives as a guide, but that as a highly competent, well-recognized individual in his field he should have a relatively high degree of freedom in approaching the topic. The above discussion is not designed to discourage the potential user, but to discourage complete dependence upon the enclosed materials.

The educational objectives for each modular unit should be seen as the heart of the guidelines. They have been developed following the plan for a hierarchical order of objectives as described in the paper by Jacob Stern which is part of Modular Unit 2. Under this system, the objectives are developed along a continuum, from the general to the specific. The objectives in these guidelines have not been developed to the highest level of specificity, in keeping with the belief that the specific details for educational programs should be planned at the local level. It is suggested that time be taken to specify detailed objectives in planning teacher education activities.

The overall objective under which the modular unit objectives were developed is as follows:

> As a result of participating in this teacher education activity, the trainee will contribute to the goal of improving the teaching-learning process in educational programs preparing health workers.

Instructional strategies are suggested for each of the modules, but once again, the user should consider numerous variables in selecting the type of activities to be used. The publications included in the annotated bibliography were carefully selected and represent some of the best material available in the field of education. Where deemed particularly appropriate a publication may be listed in more than one modular-unit, but in most cases a single listing has been made. A large number of supportive materials were included with each of the modular units for the Institute held in Iowa City. In order to reduce the size of this document, only selected materials are included.

If the objective stated above is to be achieved, it will require considerable effort on the part of many individuals and groups. Those who would accept this role are encouraged to use this document in any way they see fit to meet their needs and the needs of those they serve.

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MODULAR UNIT 1

# Supportive Personnel in the Changing Health Industry

Guidelines:

- Educational Objectives
- Instructional Strategies
- Annotated Bibliography
- Supplementary Materials
  - Report of Group Discussions
  - Like Captured Fireflies
  - Tribute to Teacher

Supportive Papers:

- Utilization and Preparation of Personnel for the Health Care Industry -- Elizabeth Kerr.
- The State of Affairs in Health Occupations Education at the Vocational and Technical Levels -- Helen K. Powers.
- The Role of the Health Specialist as a Teacher -- Robert Tomlinson.

## EDUCATIONAL OBJECTIVES

1. Following completion of this modular unit, the participant will demonstrate an awareness of the changing health industry, particularly in relation to the use and preparation of supportive personnel.

    1.1 The participant will describe the factors and conditions effecting change in the health care industry.

        1.1.1 Cites the effect of health care personnel supply and demand.

        1.1.2 Distinguishes between current and potential health care delivery systems.

            1.1.2.1 Analyzes the structures of current systems.

            1.1.2.2 Identifies major problems in current systems.

            1.1.2.3 Recognizes how health care delivery systems can be restructured to increase the quantity and quality of service.

        1.1.3 Identifies types of auxiliary personnel needed to implement restructured health care delivery systems.

        1.1.4 Identifies new approaches to organizing curricula for programs preparing auxiliary personnel.

    1.2 The participant will examine vocational and technical programs for the preparation of auxiliary personnel.

        1.2.1 Recognizes the existing stage of development.

            1.2.1.1 Identifies the breadth of health specialty offerings.

            1.2.1.2 Assesses the extent of program offerings and the number of graduates.

            1.2.1.3 Describes the strengths and weaknesses of the development to date.

        1.2.2 Evaluates the potential for program growth.

            1.2.2.1 Identifies specific program needs.

            1.2.2.2 Recognizes trends influencing the development of educational programs.

1.2.2.3 Recognizes the potential and implications of current legislation.

1.3 The participant will examine the role of the health specialist as a teacher.

1.3.1 Recognizes the need to acquire a new orientation and role.

1.3.2 Recognizes the conflicts which may develop in the dual role of health specialist and teacher.

1.3.2.1 Identifies the existence of, or potential for, role conflicts.

1.3.2.2 Cites possible role conflict situations.

1.3.2.3 Suggests ways to reduce the problems of role conflicts.

1.3.3 Recognizes the functions of the health specialty teacher.

*1.4 The participant will examine the role of the teacher of teachers.

1.4.1 Recognizes the need to acquire an image as a teacher of health specialty teachers.

1.4.2 Recognizes the functions of the teacher of teachers.

* This objective is relevant for the original institute but may not be appropriate for a local short-term teacher education activity.

## INSTRUCTIONAL STRATEGIES

General presentations on each of the topics are deemed appropriate. Due to the type of behavior change desired, an activity which includes a great deal of participant involvement is suggested for the role and identity topic.

Following the general presentations, discussion groups are suggested to allow the participants to react to the concerns presented. The participants would be asked to indicate whether they agree to disagree and to make whatever contribution they can to the problems posed. Particular concern should be directed toward the identification

of common and unique problems across health specialty fields. Participants should be encouraged to verbalize their feelings regarding new approaches to providing health care and the problem of role changes. Every effort should be made to view the possibilities of change from a positive frame of reference.

To provide a broader experience for all and to bring about closure for this module, it is suggested that a summary be made of each group discussion and that these summaries be reported to the entire group, along with the comments of the staff.

## ANNOTATED BIBLIOGRAPHY

Coggeshall, L.T. Planning for medical progress through education. Evanston, Illinois: Association of American Medical Colleges, April 1965.

This report briefly outlines the perspective within which American medical education has developed, the major trends related to health care that are now emerging, and their implications for medical education and the work of the Association of American Medical Colleges. The report gives specific attention to the past and present roles of the association, and the steps the association should take to channel its future development along the lines that will enable it to provide the positive and effective leadership that the field of medical education will inevitably require in the years and decades immediately ahead.

Evans, R.N., Mangum, G.L., and Pragan, O. Education for employment: The background and potential of the 1968 Vocational Education Amendments. Ann Arbor, Michigan: Institute of Labor and Industrial Relations, May 1969.

This paper is an attempt to write a more conceptual and "popular" version of the information contained in Vocational Education: The bridge between man and his work. It outlines those historical trends which have made formal preparation for employment increasingly a requirement for success in the job market. It identifies the legislative and administrative short-comings which limited the impact of the promising act of 1963. It describes the current state of vocational education. Most important of all, it sets forth a philosophical justification for a vocational education which can more than prepare youth for employment; it can also provide the motivating techniques to "make an education relevant."

Franke, W. and Sobel, I. The shortage of skilled and technical workers. A Report to the Manpower Administration, Contract No. MDTA 5-64, Institute of Labor and Industrial Relations, University of Illinois, June 1968.

Licensed practical nurses and medical technologists were among the six skilled and technical occupations, for which there were apparent shortages of labor, that were selected for study to determine the degree to which labor market institutions respond to and facilitate adjustment to varying degrees of labor market tightness. The study was designed to examine the entire labor market process involved in the attraction, training, placement, and retention of workers in the selected occupations in two large labor markets. Each of the occupations could be described as at an intermediate level in the hierarchy of occupations. Each required some specialized training beyond a high school education, but none required completion of college education at the baccalaureate level.

Greenfield, H.I. and Brown, C.A. Allied health manpower: Trends and prospects. New York: Columbia University Press, 1969.

A careful reading of this book suggests that improvement in recruitment, education and training, and utilization of allied health manpower can come about only through a variety of innovative actions at many different leverage points in the system of medical and health care. The authors feel that effective recruitment and promotion policies must be devised where presently lack of opportunity for advancement discourages many potential workers. A second major thrust must be to improve the education and training methods of allied health manpower. This book is presently one of the best single sources of information on the status of this field.

Hensel, R.H. (Chm.) The delivery of health care services. Symposium presented by the National Pharmaceutical Council, Inc., Washington, D.C., November 21, 1968.

The purpose of the symposium was to focus on several of the problems faced by the health care profession, so that the implications relevant to the quality of future patient care are better understood. The following papers were presented: (1) Getting Health Care to People by M.A. Haynes, (2) The Institutional Role in Better Health Care by J. B. Donaldson, (3) The Pharmacist on the Health Care Team by L.C. Zopf, (4) The Medical Foundation Approach to Health Care Services by D. C. Harrington, (5) The Education of the Physician and the Public by A. Richardson, and (6) A Time for Candor by R.C. Byrd.

Manpower for health, national needs and federal programs. A Report to the Assistant Secretary for Health and Scientific Affairs, Washington, D.C., July 1969.

A philosophy underlying the development of a health manpower policy is presented. Medicine today offers great promise in the alleviation of human suffering. Our society is committed to the removal of the barriers which have kept many people from the fulfillment of this promise. Hospital and other health facilities have been constructed. Financial barriers to the receipt of care are being removed. Today the critical need is for health manpower -- the right numbers and kinds of people in the right places.

Report of the National Advisory Commission on Health Manpower: Volume I. Washington, D.C.: Government Printing Office, November 1967.

To assist him in responding to the challenge of providing for the Nation's health care, President Johnson established the National Advisory Commission on Health Manpower to "develop appropriate recommendations for action by government or by private institutions, organizations, or individuals for improving the availability and utilization of health manpower." This report is a compilation of the Commissions conclusions and recommendations.

Skaggs, K.G. A guide for health technology program planning. Washington D.C.: American Association of Junior Colleges, 1967.

It was the search for a new educational resource to provide qualified technical assistance within health fields that led to the formation of an ad hoc committee composed of representatives of the American Association of Junior Colleges and the National Health Council. The guidelines reported herein constitute the report of the committee members. The Guide has as its focus the building of strong programs within two-year collegiate institutions through the collaboration of junior colleges with health practitioner associations and community health facilities.

The transition from school to work. A report based on the Princeton Manpower Symposium, May 9-10, 1968, Princeton, New Jersey.

The Princeton symposium on the "Transition from School to Work" was an undertaking of the U.S. Department of Labor and Health, Education, and Welfare and the National Manpower Policy Task Force, in cooperation with the Industrial Relations Section and the Woodrow Wilson School of Princeton University. Its objective was to summarize and review the dimensions of the youth employment problem and to

discuss the roles and responsibilities of schools, private enterprise, trade unions, voluntary agencies, and various levels of government in development of better bridges between school and work for noncollege-bound youth.

U.S. Department of Health, Education, and Welfare, Public Health Service. Health Manpower, Perspective: 1967. Washington, D.C.: Government Printing Office, 1967.

This report brings together information of significance to those who are responsible for education in the health professions, in the development of new knowledge, and in the organization of health services. It also indicates areas in which we lack knowledge and capacity to prepare enough people who are committed to serve at the highest possible level. Sound knowledge, the effective deployment of scarce resources, improvements in education, and the attraction of able young people to all the occupations which make good health possible will bring significant progress toward the goal of good health for everyone.

U.S. Department of Labor. Manpower report to the President. Washington, D.C.: Government Printing Office, January 1969.

The seventh annual report by the Department of Labor on manpower requirements, resources, utilization, and training recounts the rapid development of a national manpower policy and the progress made toward full, productive, and satisfying employment for American workers. The present report assesses the manpower record of the 1960's. It discusses the significant advances made and the policies and programs which have contributed to them. It is concerned also with the major continuing needs in the manpower field, and points to those which are now high on the agenda for national action.

U.S. Department of Labor. Training health service workers; The critical challenge. Proceedings of the Department of Labor-Department of Health, Education and Welfare Conference on Job Development and Training for Workers in Health Services, Washington, D.C.: Government Printing Office, 1966.

The Labor-HEW Conference was planned and conducted as a medium for the discussion of issues, for the exchange of views, and for the sharing of experiences in matching people and jobs in the health service industry. In addition, it provided an opportunity to explore the various ways of meeting the health manpower needs of today and of the future, in terms of recruitment, training, and deployment of supportive health personnel. During the discussion sessions, conferees offered many suggestions for increasing the quantity and quality of health service workers.

Venn, G. Man, education, and work. Washington, D.C.: American Council on Education, 1964.

The national economy and social structure will suffer irreparable damage unless the schools provide far more and far better education on the semiprofessional, technical, and skilled levels. This report calls for a massive response on the part of American education--particularly higher education--to the challenge of changing world of work. This response will involve new thinking about a system of education in which 80 percent of students--the high school dropouts, and high school graduates who do not go on to college, and those who do not finish college--are entering a technological world of work unequipped with the tools they need for survival.

Vocational education: The bridge between man and his work. A general report of the Advisory Council on Vocational Education. Washington, D.C. Government Printing Office, 1968.

The Advisory Council on Vocational Education was charged in section 12, Public Law 88-210, with the responsibility of making recommendations concerning the program and administration of vocational education, and legislative changes designed to improve the quality and quantity of vocational education, so that persons of all ages in all communities of the State will have ready access to vocational training or retraining which is of high quality. Such training should be realistic in light of actual or anticipated opportunities for gainful employment, and be suited to their needs, interests, and ability to benefit from such training. Accordingly the council presented in Part I of its report a comprehensive review of vocational education in the United States conducted under the provisions of the various vocational education acts. In Part II, the council elaborated upon its findings in evaluative terms to prepare an appropriate base upon which to present its recommendations to the Secretary of Health, Education, and Welfare, the President, and the Congress.

## SUPPLEMENTARY MATERIALS

### Report of Group Discussions

Following presentation of the supportive papers for this modular unit at the national teacher education institute the participants had an opportunity to discuss the topic areas in small group sessions.

One individual from each of the groups made a report to the larger group.[1] The following is a synthesis of their reports.

The growth curve in health occupations is tremendously impressive. By 1975 health employees will be the 3rd largest industrial group. Greater number of students in high schools will aspire to health occupations careers.

One of the biggest problems is acceptance of the use of supportive workers by the older generation physicians. This problem extends to all areas of the allied health field, but we cannot wait for the young medical people to be in practice to accomplish the needed changes. We must change the attitudes of the medical people who are presently in practice.

## Dialogue between Professional Organizations

Professional organizations are defensive by nature. Some of those which are well established are attempting to perpetuate themselves by blocking the entrance of new members by any except the traditional routes defined by the organization. At the same time, individuals in emerging occupations are striving to organize and to receive recognition, e.g., practical nurses and respiratory therapist. When the older professional organizations sees these new groups encroaching on their territories, they tend to resist their formulation by opposing licensure, denying recognition, or by other means. It appears, however, that the development of new categories of health workers are so overwhelming at the present time, that we are finding a break in traditional patterns and in many cases professional organizations are recognizing them. Examples cited are physician assistants, pediatric aides, optometric aides, etc.

Political problems related to diverse interests tend to be bypassed whenever a community is faced with solving a problem common to all the groups involved. An example of this is the Washington State Health Department Manpower Survey. Many agencies met together to discuss their common problems concerning needed statistical surveys.

In the past we have concentrated on differences, now we need to concentrate on commonalities. We do need to hear from advisory people. A real problem exists in terms of what single agency or organization speaks for health care in the United States. Should we have a state or national approach? Are we in need of a NASA type of organization?

---

[1]Appreciation is extended to the following individuals who served as recorders for this session: Wilma G. Gillespie, Beth Goldberg, Mary Hume, Sister M. Jerome O'Connell and Virginia Vollmer.

## Mobility in the Health Field

Several methods of credit transfer are in use, such as: (1) challenge by examination for credit, (2) registry examination pertaining to a body of knowledge vs. challenge examination for a particular course, (3) a point system that is related to particular work experience, and (4) initial examination and then advanced placement.

Inhibiting factors to upward mobility include: (1) tradition, structure of the administrative process and individuals who are not willing to accept the fact that they might lose credit if they change from one curriculum to another; (2) lack of consistency among various educational institutions in regard to one occupational area; and (3) lack of research.

## Licensure of Health Occupations Personnel

There must be minimum standards that are established by licensure certification to provide assurance of adequate preparation.

There must be developed a program to provide shared and coordinated accreditation to provide adequate standards of licensure across all areas of education for the health occupations.

The following questions were considered: (1) Is there justification for licensure? (2) Does it help to maintain standards? (3) Could we construct a super-structure to supersede licensure? and (4) Which is most effective to licensure the individual to perform certain tasks or institutional approval?

## Preparation of Instructional Personnel

What is the criteria for a good teacher - competence or effectiveness? How are the vocational amendments going to change health occupations education? What agencies have an influence on teacher preparation and what is this influence? What are the minimal competencies of a health educator? Should health occupations education teachers be educators or technically qualified personnel to teach the required subjects?

Why do we need medical directors? Is it only for accreditation purposes? When we see a new type of person developing we need to develop supervisors and teachers. How do we go about finding out which person best fits which position? Are we training properly? Are we overtraining or undertraining? What are the values of the various Arts and Science courses in relation to technical health occupations education? It is not practical to offer separate courses in educating teachers for each of the health occupations. Continuing education for

health professionals provides a great opportunity for them to learn about each other; this conference is an example of that. Conference members have the responsibility to cultivate group interaction. There is an immediate affect at the local level when people are willing to look at each other in a positive way.

## Like Captured Fireflies

My eleven-year old son came to me recently and in a tone of patient suffering, asked, "How much longer do I have to go to school?"

"About fifteen years," I said.

"Oh Lord," he said despondently. "Do I have to?"

"I'm afraid so. It's terrible and I'm not going to try to tell you it isn't. But I can tell you this--if you are very lucky, you may find a teacher and that is a wonderful thing."

"Did you find one?"

"I found three," I said.

It is customary for adults to forget how hard and dull and long school is. The learning by memory all the basic things one must know is the most incredible and unending effort. Learning to read is probably the most difficult and revolutionary thing that happens to the human brain and if you don't believe that, watch an illiterate adult try to do it. School is not easy and it is not for the most part very much fun, but then, if you are very lucky, you may find a teacher. Three real teachers in a lifetime is the very best of luck. My first was a science and math teacher in high school, my second a professor of creative writing at Stanford, and my third was my friend and partner, Ed Ricketts.

I have come to believe that a great teacher is a great artist and that there are as few as there are any other great artists. It might even be the greatest of the arts since the medium is the human mind and spirit.

My three had these things in common--they all loved what they were doing. They did not tell--they catalyzed a burning desire to know. Under their influence, the horizons sprung wide and fear went away and the unknown became knowable. But most important of all, the truth that dangerous stuff, became beautiful and very precious.

I shall speak only of my first teacher because in addition to other things, she brought discovery.

She aroused us to shouting, bookwaving discussions. She had the noisiest class in school and she didn't even seem to know it. We could never stick to the subject, geometry or the chanted recitation of the memorized phyla. Our speculation ranged the world. She breathed curiosity into us so that we brought in facts or truths shielded in our hands like captured fireflies.

She was fired, and perhaps rightly so, for failing to teach the fundamentals. Such things must be learned. But she left a passion in us for the pure knowledgeable world and me she inflamed with a curiosity which has never left me. I could not do simple arithmetic but through her I sensed that abstract mathematics was very like music. When she was removed, a sadness came over us but the light did not go out. She left her signature on us, the literature of the teacher who writes on minds. I have had many teachers who told me soon-forgotten facts but only three who created in me a new thing, a new attitude and a new hunger. I suppose that to a large extent I am the unsigned manuscript of that high school teacher. What deathless power lies in the hands of such a person.

I can tell my son who looks forward with horror to fifteen years of drudgery that somewhere in the dusty dark a magic may happen that will light up the years...if he is very lucky.

- John Steinbeck, CTA Journal, 51:7; November, 1955.

## Tribute to Teacher

A teacher is a courageous mortal in the minority who must cultivate the temperament of an angel in meeting and surmounting the downright deviltry of those other angels(?), our precious but precocious offspring. Besides being intelligent, a teacher should be psychic to better anticipate and counter the mischievous monkeyshines of our little darlings.

A teacher must be father, mother, and Emily Post . . . yet the belt strap that father once used behind the woodshed to preserve order is now outmoded and even the sharp, sensory reminder of teacher's ruler must be replaced by more subtle psychology.

A teacher is a diplomat of the highest order. She must placate irate parents who may have been masterfully misinformed with regard to some classroom disciplinary action wherein teacher, not student, is made to look the monster.

On the other hand, to those bearing gifts teacher must turn a wary eye, separating, as it were, the wheat from the chaff, acknowledging genuine appreciation while endeavoring not to show favoritism and setting right those who would give only with the hope of gain. To help most in bringing out the best in his or her charges, the teacher must know the heart and home life of every student.

A good teacher will spark the dull, subdue the riotous and inspire the interested. On those days that are just plain murder, teacher must

muster a smile. Naturally, it would never do to let indisposition show or to let the class work a wedge under the teacher's outward look of calm.

Ah, those hectic days and those weary nights with quiz papers to correct and report cards to make out. Cares weigh heavy and worry lines begin to show. Graduation approaches and the wonder is so many grow, and go on and up and off to conquer the world.

And then men and women return and teacher's sternness to the boys and girls then is a memory now, and only now is the sternness appreciated and teacher becomes a fond part of a youthful past. The many precepts so arduously instilled, happily stands as guideposts to mark the path of better citizens--the teacher's rich reward so hardily won.

- Author Unknown

## UTILIZATION AND PREPARATION OF PERSONNEL FOR THE HEALTH CARE INDUSTRY

Elizabeth E. Kerr[1]

Predictions are that by 1975 the health industry will be the nation's largest employer, with one out of every 16 workers employed in the health field. Today, our national health bill exceeds fifty billion dollars, the total national budget of all but eight nations in the world. Yet, the demands of our society for more and better health services continue to be widespread and ever-growing.

Factors influencing these demands stem from changes both in society in general and in the health field itself: e.g., (1) increased population (a. higher birth rate, b. lower mortality rate at birth and among infants, and c. longer life span); (2) greater public awareness of preventive and therapeutic health measures (a. improved communication, media and b. national disease-oriented projects [muscular dystrophy, cancer, heart, etc.]); (3) increasing number and use of available medical insurance plans (a. high cost of medical care and b. anxious public); (4) federal legislation which subsidizes health care for specific sub-groups of our population [Medicare, Medicaid]; (5) urbanization (a. concentrated populations and b. ghetto areas); (6) facilitated transportation (a. more mobile society, b. migrant workers, and

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c. transfer of patients between types of health care agencies); (7) expanding medical knowledge (8) the burgeoning of technical health care equipment.

Our present health resources are being over-taxed and there is widespread and serious talk of a "health crisis" in this country. The indicators are evident -- long delays to see a physician for routine care; difficulty in obtaining care on nights and weekends; reduction of hospital services because of a lack of nurses; uneven distribution of care of the rural poor, urban ghetto dwellers, migrant workers, and other minority groups; obsolete hospitals in our major cities; costs rising sharply from levels that already prohibit care for some and create major financial burdens for many more.

On July 10, 1969, President Nixon brought to the nation an eight page "Report on the Health of the Nation's Health Care System" prepared by Robert Finch, Secretary of Health, Education, and Welfare and Dr. Roger Egeberg, Assistant Secretary-Designate for Health and Scientific Affairs. This document highlights the crisis in our health care delivery system. All about us we can find evidences of concern; e.g., the July 21 edition of The National Observer carried an article, "Doctors Fret Over Image, Hear Plugs for Health Care," a July issue of U.S. News and World Report, "The Crisis in Medical Care and How to Meet It," a recent news release from The Washington Post, "Need for Complete Revamp of Health Care."

It is imperative that our present health care delivery system be improved so that the availability and quality of health care will meet the needs of all citizens, the cost of care will be kept within reasonable bounds, and plans for the future will be formulated wisely.

Early in this century, medical knowledge was so limited that an individual physician could treat most illnesses for which treatment was available, and a single practitioner frequently cared for several generations of the same family. Care was usually provided in the patient's home or the doctor's office, while hospitals were reserved for the mortally ill.

Since World War II, medicine has undergone radical change. It has participated in the general explosion of science and technology, and possesses cures and preventives that could not have been predicted even a decade ago. Continuous care from a single physician has become increasingly rare. Scientific progress has made the individual practitioner technologically obsolete, and has made it necessary to provide group services so that there can be specialization as well as access to highly technical equipment. Almost all new practitioners are specialists and are supported by a variety of skilled personnel; medical services are fragmented by disease categories and methods of payment; the lace of care is moving steadily from the home to the physician's office and

increasingly, to hospitals, extended care units, skilled nursing homes and community health clinics or neighborhood health centers. How true it is that the old-fashioned doctor has disappeared. But then, so has the old-fashioned family!

There are two kinds of forces working for changes in the delivery of health care -- technological advances and social changes. Technical advances are those such as we are finding in heart surgery and renal dialysis, and those effected by computers and other electronic equipment. But how true was Sydney Harris' statement of August 12 in his syndicated column captioned Perils of Ruliance on Gadgetry! "...Reliance on technology is looked upon as a substitute for people rather than as an added tool for human skills, judgment and concern. The bleeps and flashes can only warn; they cannot cure, and they do not care."

The second force for change in the delivery of health care is the important social changes which have occurred. It is apparent that the American people have decided that health care shall be delivered equally to all segments of our society. Despite our high level of technological acumen, our country presently ranks 15th in perinatal mortality and 13th in length of life; and there are indignities and lack of personal attention which characterize health care in the ghettos. We fail to correctly read the riots and civil disturbances in our cities if we do not assume there is going to have to be substantial changes in the way we distribute health, education, housing and income to all levels of society.

On scientific grounds alone, health services will be increasingly grouped around hospitals. This will include, in addition to the general care with which we are all familiar, organized ambulatory care in neighborhood health centers or group practice centers, community mental health centers and provisions for various kinds of chronic care -- nursing home care and rehabilitation as well as domiciliary care. The net effect of these changes and those that are yet to come is that medical care will be organized to give people access to specialized equipment and skills. This reorganization of the health delivery system has, to some extent, already begun but medical care in the United States continues to be more a collection of bits and pieces (with overlapping, duplication, great gaps, high costs, and wasted effort), than it is an integrated system in which needs and efforts are closely related. Unless major changes are accomplished more quickly than has ever been possible in the past, a more serious "crisis" will be inevitable.

These changes will demand even more and better prepared health manpower. In 1966, William H. Stewart, then Surgeon General, U.S. Public Health Service, predicted we would need to prepare 10,000 health workers per month for the next ten years, a total of about 1 1/4 million. Three of these ten years have already elapsed and it appears that we are getting "behinder and behinder" in progress toward reaching this goal. Moreover, in the meantime, further needs are continually being identified.

Meeting the needs for more and better prepared health manpower poses real challenges. There must be improved utilization of personnel now employed within the present patterns and "systems" of care. It is also imperative that there be a marked increase in the number of available prepared health workers. Failing to accomplish these measures, there can be no alleviation of the crisis. The challenges, while staggering, are not impossible if forces of all segments of our society can be mustered to meet them.

Many barriers now exist, however. The majority of these barriers were placed by the traditions of another era and are maintained by a kind of thinking more appropriate to a guild of the middle ages than to a modern profession.

Too often there have been obstacles to introducing new careers or mobility in the health manpower hierarchy for workers who begin at the bottom. Today, in order to advance upward in the health disciplines, it is generally necessary to go back to the beginning and start over. Academic credits acquired in pursuit of one occupational goal rarely count toward a higher goal, and work experience is generally undervalued. This is extremely discouraging to the individual and is wasteful of talent that will always be in short supply. People should be challenged with promise at every entry level. Why should they be trained in such a way that we put a heavy lid on their aspirations?

A registered nurse in California recently wrote a letter published in the American Journal of Nursing -- "I graduated from a diploma program in nursing. After one year of employment, I decided to study for a degree, only to be totally discouraged by the educators who should have been encouraging.... There does not seem to be a realistic approach to bringing the three-year nurse into the formal education system. A nursing degree, it seemed, was not possible. At present I am obtaining my degree in another field."

At each rung of the ladder there can be found one or more organized groups whose principal aim has been to erect barriers aimed at reducing the access of other workers. In most instances these groups have succeeded in gaining the approval of state education authorities for their conditions and often they have further protected themselves by having their requirements approved by one of the principal health organizations. Under these conditions they are in a powerful position to fend off encroachment.

In many instances health professionals have been reluctant to accept assistance from supportive health personnel. It is only when the demand has been so great as to outweigh the loss of services that professionals have acceded to the performance of certain functions by prepared technicians and assistants, first on a de facto basis, than on a de jure basis.

In November 1968, a past president of the American Council on Pharmaceutical Education, in a National Pharmaceutical Council meeting in Washington, D.C. said: "Health professionals are confronted with numerous small revolutions; revolutions of ideas, revolutions of technology, of practice, of attitudes and goals. Pharmacists must re-evaluate their duties and reassign some of their technical functions." Yet just two weeks ago in a conversation with me, this same individual expressed great reluctance to encourage the formal preparation of workers supportive to the pharmacist; preferring instead, only on-the-job training.

Continuing education to assist health professionals to understand the roles of, and their relationships to, supportive health workers has been almost negligible. As a result, there has been noted over-utilization, under-utilization and, in general, poor utilization of the allied health workers already prepared and available.

There must be an examination of current practices in certification, registration, licensure, accreditation, and program approval as these relate to maintaining and improving quality in education programs preparing supportive health-care workers. Speaking at the May 1969 meeting of the American Nurses' Association's Council of State Boards of Nursing, William K. Selden, LL.D., former director of the National Commission on Accrediting posed the question, "Are we properly structured in our licensing system to fulfill our social functions?"

In the face of public pressures on health care professionals and growing resentment of their autonomy, Dr. Selden proposed major changes in our present system of independent licensing boards which are now, in most states, made up solely of members of the profession in question. He suggested a single board, with representatives from the public and the several professions, to license members of all the health professions with committees representing the individual professions reporting to it. He said this system would be more democratic and assure protection of the public interest; Dr. Selden also believes that our present systems risk breakdown if faced with public confrontation.

Still another barrier to increasing health manpower is that, to date, the labor force of allied health-care workers has been predominately women. Despite large turnover rates characteristic of a young female labor supply, the health services industry between 1950-65, had expanded from 1.5 to 2.8 million; or by 87%, 2 1/2 times the rate of our economy as a whole. But wages and working conditions in the health services industry continue to lag behind the more advanced sectors of our economy; and federal and state legislation have excluded hospital employees from the provisions of fair labor standards acts.

Yes, it will require the cooperative efforts of many different groups to reduce these barriers, many of which have no justification other than to protect the position of those already ensconced. The demand for health care continues apace. If meeting this demand relies heavily on the rapid expansion of allied health manpower, the preconditions for some easing of restrictive arrangements may exist if health agencies, health professional organizations, licensing boards and consumer groups work together to rewrite the laws and administrative practices; and if they move simultaneously and energetically to develop training and promotion policies which will open multiple career lines and make these careers accessible to those who desire, and qualify for, employment in the health field.

Many are tired of platitudes about shortages and suggested remedies, and are insisting on moving into the problem-solving phase. However, it is imperative that this problem-solving phase entail cooperation, organization, and thoughtful deliberation. Let us be cautioned by a statement written by John W. Gardner, former Secretary of Health, Education and Welfare, in his paper, "A Nation is Never Finished":

"Responsible men and women concerned to achieve goals have to cope with two contrasting attitudes on the part of their fellow citizens. One is a violent, explosive impatience to get it all done instantly -- and bitter disillusionment if that doesn't happen. The other is a disinclination to take any action at all -- sometimes from disagreement with objectives, more often from apathy or cynicism. Both attitudes pose serious threats. We can be brought down by the volatility of our aspirations or by our incapacity to aspire."

Government alone is not big enough to solve the problems. The capabilities of the combined federal, state and local governments are small compared with the combined resources and experience of the private sector -- the professions, voluntary agencies, religious and educational institutions, hospitals, organized labor, business and industry, and concerned citizens. The resources of each of these very powerful forces should be applied to effectively reshape the health care system. Too often in the past government has operated independently, even blindly; and, the private sector has been reluctant to give up outmoded practices that are unsuited to the incredibly rapid changes of our society -- to new and increased demands. Care must be taken to assure that action is concerted lest each separate course of action should become a self-contained compartment to be buttressed and defended, building a new set of rigidities into a system that is desperately in need of the fluid and flexible.

Expansion of educational opportunities to prepare health workers at all levels in health technologies is needed if both the industry and

and people needing employment are to be served. Too often, health manpower has been considered in terms of doctors, dentists, and nurses alone and the problems of supporting personnel have been overlooked or ignored. But it makes no more sense to ignore the need for supportive personnel in the health field than it would to have all symphony conductors and no instrumentalists.

Technological advancements have found their way into offices of the most isolated rural physician as they have the most sophisticated university and community medical centers. The consequences in the education of members of the health team are almost immediately evident.

M. Alfred Haynes, M.D., Project Director, National Medical Association Foundation, Inc., at the National Pharmaceutical Council, Washington, D.C., November 1968 said: "At the risk of being burned at the stake, I venture to suggest that, even more than doctors, this country needs new kinds of health workers -- especially the paramedical types. Many of the basic health needs of the community can be met without the many years of training required by the specialist."

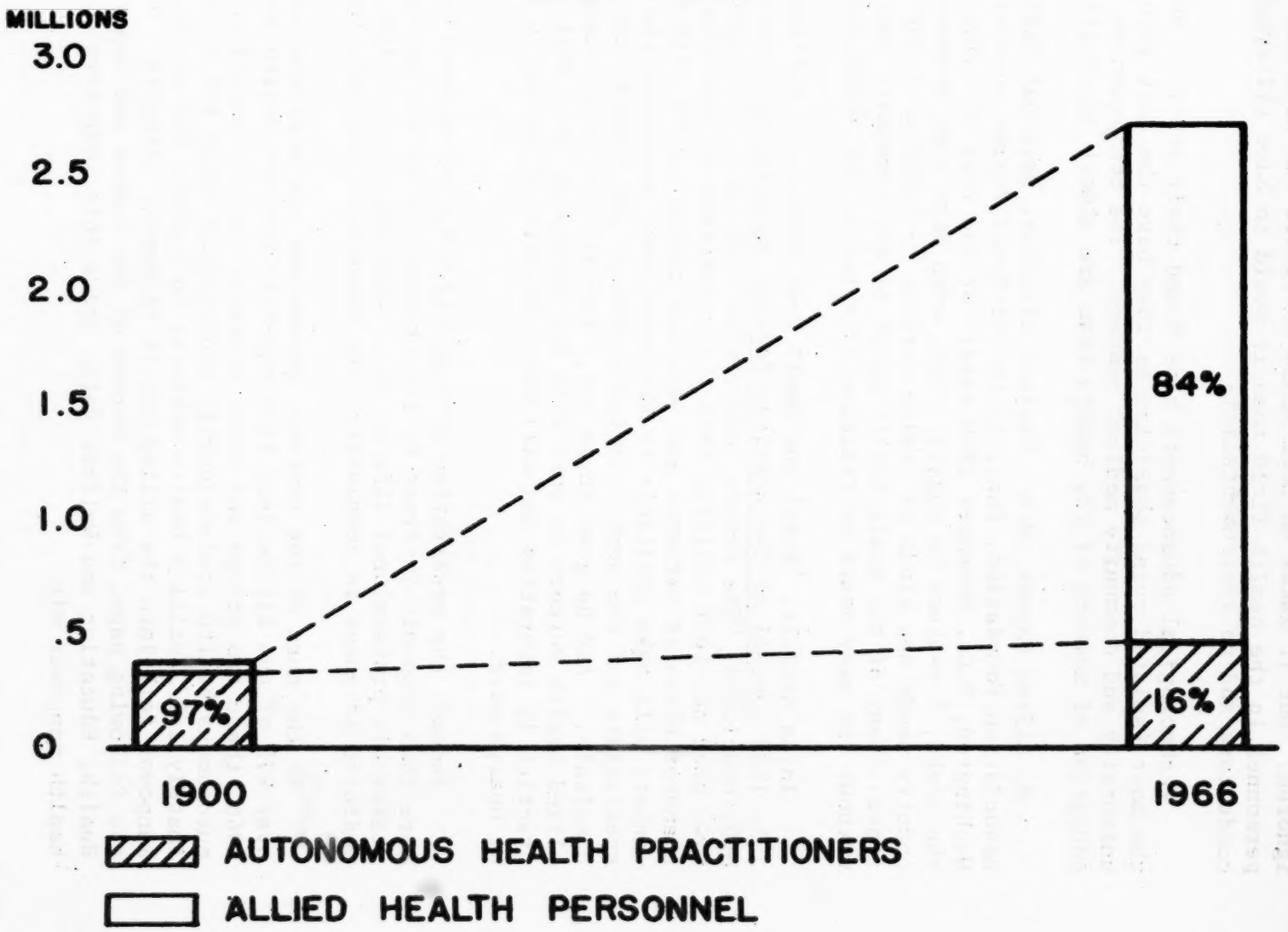
In an article, "Rural and Small Town Practice," published in the July 1969 Journal of the American Medical Association, George T. Harrell, M.D. concluded: "The future family physician in a rural area or small town need not feel isolated from the mainstream of medicine. Improved transportation of patients and improved communication with medical centers will make available to the practicing physician the skills of specialists and the sophisticated equipment and technicians of regional hospitals." And he goes on to say, "Preparation of adequate numbers of allied health workers to work with the physician in a small group practice is imperative and will make him more effective in the delivery of health care.

Indeed, the preparation of supportive health workers is of much more than academic interest to the primary health professional. He stakes his professional life on their competence every day. As medicine advances in complexity, his dependence can only increase.

At the turn of the century, physicians and dentists constituted over 97% of the little less than one-half million health workers. In 1966, these two groups and other doctoral level occupations (the autonomous health professionals) represented about 16% of the approximately 2 1/2 million health workers; therefore, 84% of this health manpower fell into the allied health personnel category. The graph on the following page, from the Bureau of the Census and Department of Health, Education and Welfare data, shows this long-term trend in the health manpower mix.

# HEALTH MANPOWER

## 1900 - 1966



Further evidence of expansion in allied health personnel is shown by figures which compare the 1965 with the 1967 estimated numbers of persons employed in selected occupations within several health fields:

GROWTH IN SELECTED HEALTH OCCUPATIONS

| | | | | |
|---|---|---|---|---|
| Physicians | 288,700 | 305,500 | 16,800 | 5.8 |
| Registered Nurse | 621,000 | 659,000 | 38,000 | 6.1 |
| Licensed Practical Nurse | 282,000 | 320,000 | 38,000 | 13.4 |
| Nurse Aide, Orderly, Attendant | 500,000 | 800,000 | 300,000 | 60.0 |
| Home Health Aide | 6,000 | 12,000 | 6,000 | 100.0 |
| Medical Laboratory Scientist | 3,500 | 4,000 | 500 | 14.3 |
| Medical Lab. Technologist | 35,000 | 40,000 | 5,000 | 14.3 |
| Medical Lab. Technician & Aide | 46,500 | 56,000 | 9,500 | 20.4 |
| Dentists | 93,400 | 98,700 | 5,300 | 5.7 |
| Dental Hygienist | 13,500 | 15,000 | 1,500 | 11.1 |
| Dental Assistant | 91,000 | 95,000 | 4,000 | 4.4 |
| Dental Lab. Technician | 25,500 | 27,000 | 1,500 | 5.9 |

Source: U.S. Public Health Service - Publication No. 1509 - 1968

The supply of physicians and dentists has not responded rapidly to increased demands for health care, and predictions are that there will be no appreciable increase in the number of autonomous health professionals being prepared. Professional health workers are increasingly accepting assistance from supportive personnel so that their time and talents can be more efficiently utilized and a larger number of people can be served. The supply of nurses and auxiliary personnel has expanded and, while roles and their relationships among health workers have been changing, these changes must be accelerated. This will require even greater use of supportive health-care personnel; role types already established, emerging types, and types as yet unknown. The lead time for the training of health personnel, with the exception of the autonomous health professionals (physicians, dentists, etc.) is relatively short; thus a rapid response to rising demands is possible.

Arthur P. Richardson, M.D., Dean, School of Medicine, Emory College tells us that in the past we have made a mistake by overtraining health workers and that we must look at each particular training program and decide what the function of the graduate will be, give him the training that he requires and say, "this is it."

The magnitude of the training challenge is enormous in quantitative terms. Two things must be done. We must (1) augment and make the best possible use of programs and facilities for preparing health professionals, and (2) give greatly increased effort to the analysis of health service functions, to the development of meaningful technician and assistant groups, and to the development and support of training programs which will prepare people to work together much more effectively.

While some of the most enlightened planners are undertaking a careful analysis of the skills and knowledge currently being demanded of a worker to function safely and effectively in each health occupation, constant review is necessary because as medical practice changes, planners must be alert to demands for new categories of personnel.

In the past, supportive health-care workers were prepared in hospitals, primarily through on-the-job training. Hospitals can no longer continue to carry the major burden for financing, administering, housing, staffing, and planning for the broad and complex training responsibilities. Traditionally, costs of hospital-based programs have necessarily been included as service charges and therefore borne by patients.

The accelerating trend to transfer training responsibilities from health service agencies to educational institutions is evident. This trend embraces the philosophy of charging educational costs to educational institutions supported by the public tax base. Furthermore, twelfth grade achievers prefer the college setting for post-secondary education.

However, the shift in educational responsibility has been made possible because the service agencies have been willing to cooperate with the educational institutions by providing clinical facilities in which students may have their practicum under the supervision of the faculty employed by the educational institution.

This cooperative arrangement, generally carried out under a written contractual agreement between the educational agency and the clinical agency also enhances the opportunity for students to identify and appreciate the many roles among health workers; and their relationship, one to the other. No health-care worker can be trained in isolation from the health complex of which he will become a part.

Teamwork in the health field is not an assembly line where each man tightens his particular bolt, more or less irrespective of what happens before or after. Skills don't just touch each other; they are interwoven.

Today, post-secondary programs comprise the larger portion of health occupations education; the great majority of these are administered under the Vocational-Technical Acts. The more traditional self-contained or single-purpose curriculums are predominant. For the purpose of assisting area junior or community colleges and vocational-technical schools to develop quality programs in health occupations education, the American Association of Junior Colleges and the National Health Council cooperated to develop "A Guide for Health Technology Program Planning" published by the U.S. Office of Education.

But more effort must be directed to career orientation programs for persons interested in the health occupations, and to stimulating more rapid development and implementation of these concepts. New models for effective health occupations education must be developed at both the post-secondary and secondary levels of education.

In secondary schools there should be an expansion of offerings for high school youth interested in health careers. Such programs should: (1) provide for the exploration of health occupations and prepare youth for admission to post-secondary health occupations curriculums, and (2) provide quality training programs for those youth who will not be continuing their formal education after leaving high school and who choose to work in an entry-level health occupation.

Opportunities for an early orientation to health careers and to the roles of health workers should be made available to elementary school students and yes, even kindergarten students. This over-all plan for orientation could not only help students become knowledgeable about the broad opportunities in health fields but should also assist each one who aspires to become a health worker to select, from among the many types of preparatory programs, the one program which is most in keeping with his interest, motivation, and abilities.

Presently, there is little knowledge of health occupations other than about doctors and nurses, and even less knowledge of educational opportunities. Efforts to disseminate career information, now being expended primarily by professional organizations and government agencies, should serve to increase the awareness of health careers and training for these careers, but such efforts need to be broadened.

We must expand health occupations education to serve the training needs of the handicapped, the disadvantaged, minority groups, the older worker, youth under 18 and other similar groups. Project REMED, which encourages the preparation of returning veterans for occupations in the

health field, and President Nixon's recently disclosed plan for welfare reform further emphasize the need for this expansion.

Recruitment of students into programs of health occupations education should be intensified by such techniques as placing occupational counselors on high school campuses. Basic to this, however, is effective counselor training for the allied health field. More men must be incorporated into the health field, not only as students of a health career but also as teachers and administrators of educational programs. The prevailing image of health careers as a women's domain can change only if a larger number of men are attracted to this field. This will also tend to effect a greater degree of stability in the health-care work force.

As any system evolves, modifications and effects are slow due to the evolutionary nature of a changing system. At this time it is difficult to predict what ultimate effect the changing system of health-care delivery will have on the education of supportive health workers. Therefore, the most essential ingredient for education programs is that they be susceptible to needed changes and that opportunity for change be built into programs.

A new focus on "core" subjects common to many health occupations curriculums, and on "career ladders" and "career lattices," with articulation both vertical and horizontal, is long overdue. Frequently, a single educational institution offers several types of programs in health occupations education. When these programs cluster by field of preparation or because of certain commonalities in their content, selected subject matter can be taught in common or "core" courses. This would not only provide better utilization of instructional personnel but would also give students more opportunity to learn about, and appreciate the roles of, other members of the health team.

The establishment of "career ladders" to provide for mobility either upward or downward within a specific health field, seems imperative. In the past, most one-and two-year programs related to a specific health field have been operated as independent entities with little or no inter-relationship. Curriculums need to be designed to facilitate progress from vocational to technical to professional education and practice in the health occupations. Only then can the greatest contributions be made by those having the desire, motivation and abilities to move to a higher level of preparation.

While the career ladder promotes the concept of mobility within a specific health field, the "career lattice" is a concept which would allow for movement into another health field; horizontally, upward, or downward.

Curricula used by the military must be evaluated to determine to what extent "advanced standing" can be given to returning corpsmen or other veterans seeking admission to programs. Equivalency examinations have far reaching implications for health occupations education in that they provide a means for unlocking dead end careers. To facilitate the use of equivalency examinations, the objectives for each course in every curriculum must be realistic, clearly identified in writing, and stated so that the expected behavioral outcomes can be measured and evaluated.

Dr. Robert Kinsinger, Program Director, W. K. Kellogg Foundation, has said, "The heart of any educational effort is its corps of teachers. A wealth of clinical experiences, ready access to a fine library, and even exposure to practitioners worthy of emulation are only important aids to the central ingredient: the competent teacher.

Ambitious plans for educational programs preparing health service workers have dealt with curriculum organization, financing, student recruitment, laboratory facilities, arrangements for clinical practice, and textbooks. Too little has been done to build a prepared corps of instructors; and few universities have undertaken programs to enable an individual to shift from an allied health practitioner to an accomplished teacher in the health field. The objectives of teacher-education programs are based on the assumption that the trainee is a competent, experienced health practitioner. Programs for identifying outstanding health practitioners and preparing them as instructors must have top priority in any plan for job development and training. Without an adequate corps of qualified and effective teachers, energy expended on the other facets of educational programs is misdirected.

In 1966 there were 3,652 teachers employed in vocational-technical programs in health occupations education. The number rose to 6,508 by 1968, an increase of over 75%. To meet the needs for greater numbers of instructional personnel to staff additional programs and teach more students, we must develop a philosophic base on which to establish and utilize criteria to effect differentiated staffing in this field of education. We must identify potential sources of master teachers, teacher assistants, and teacher aides and use their talents by providing them tasks and responsibilities which are commensurate with their abilities. Additional supervisors, consultants and administrators for health occupations education will also be needed.

There is great need to study and improve teaching techniques and materials currently being used in health occupations education. A multi-media approach to instruction is now possible because many promising ways to stretch instructional talent have burst upon the educational scene in great profusion during the past decade.

Current practices in preparing teachers for programs in health occupations education must be analyzed, emerging teacher education programs examined, and a rationale for the development of further inservice and preservice teacher education developed. With well-prepared teachers, the other facets tend to fall more easily into place as we work toward the ultimate goal: a trained manpower pool sufficient to serve the health needs which exist in this country.

In summary, it appears that technological advances and the evolving system for the delivery of health-care services produce three major implications for health occupations education:

1. Administrative and instructional personnel must be increased in number; they must be receptive to change, perceive themselves as agents for change, and effect the needed changes.

2. Curriculums will have to be flexible and reviewed continuously for additions or deletions; with wider use of core, ladder, and lattice concepts.

3. There must be an increased number of students; the students, also, must be receptive to change and be imbused with the desire for self-learning with programmed instructional materials available as part of the course of study.

If these many measures are to be accomplished and health occupations education improved, it is essential that there be coordination and cooperation between vocational-technical education and the many and varied groups interested in the health field. The consistent and wise use of consultants and advisory committees is also imperative.

Only when our educational functions are performed well and when our health resources are designed to encourage full individual development, will we achieve the kind of competence and dedication needed to advance the health of all citizens of this nation.

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# THE STATE OF AFFAIRS IN HEALTH OCCUPATIONS EDUCATION AT THE VOCATIONAL AND TECHNICAL LEVELS

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Health Occupations Education, for the purpose of this discussion, is defined as the program of occupational preparation conducted within the jurisdiction of public Vocational and Technical Education as authorized under various Federal acts. The program is administered by the U.S. Office of Education in partnership with State Departments of Vocational and Technical Education and serves all States and territories of the United States. Persons of all ages, in all communities, regardless of social or economic status, are eligible under the Vocational and Technical Education programs to receive education and training that is suited to their capabilities and needs and that will enable them to become employed or to advance in their jobs. In the health field, occupations for which educational programs may be offered include those requiring education below the baccalaureate degree.

The education of health personnel in our Nation has developed as a function not of one system but of many systems, each having its specific goals and, to some extent, selecting its own standards and methodologies. Health care systems within the military service, the Veteran's Administration, and the Public Health Service, as well as the civilian health services, have developed and maintained education and training for health personnel. Familiar to most people is the "system" of nursing education developed in hospital settings which still produces the largest percentage of graduate registered nurses today. Training medical corpsmen in the military services is another example wherein a health care system conducts training that is designed to meet specific needs of the system.

A relative newcomer to the field of health occupations education is the system of public education. Vocational and Technical Education, which is an integral part of that system, is rapidly becoming the largest producer of trained health manpower in categories below the baccalaureate level.

Today, the program of health occupations education in Vocational and Technical Education could be described as a multidisciplinary,

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integrated, emerging subsystem within the system of vocational and technical education. As such, the program is subject to all the conditions, both weaknesses and strengths, found within the system of which it is a part. In addition, the program is influenced by the total health delivery system for which it endeavors to prepare skilled personnel.

To find the origins of this emerging sub-system, one must look to Federal legislation enacted in 1956--namely, P.L. 84-911, entitled the Health Amendments Act of 1956. Title III of that Act, administered by the Division of Vocational and Technical Education in the U.S. Office of Education, authorized a program nationwide to extend and improve education and training "for practical nurses and other health workers of a similar nature in hospitals and other health agencies." Broadly interpreted, training for "other health workers of a similar nature" has come to mean training for those health occupations that are not deemed to be professions and that require education and training below the baccalaureate level. The range of such occupations is broad and will continue to expand as health services change and expand. Some 375 titles for health professions and occupations are listed in Health Resources Statistics for 1968, published by the National Center for Health Statistics, U.S. Public Health Service. Employment in each of the 375 occupations requires prior education and training. Growing numbers of these occupations require preparation at the post-secondary level, in one- and two-year programs.

The Federal Government, in enacting the 1956 health amendments, registered concern over the acute shortages of health workers at all levels and particularly in the supporting or auxiliary categories. This legislation was a first effort to enlist the resources of the public education system in resolving health-manpower shortages. As could be expected, the inclusion of health occupations education under this and subsequent vocational education legislation posed many new and difficult problems both for education and for health agencies and institutions. Traditionally, the latter had initiated, organized, operated, and regulated the training of health workers; on the other hand, educational institutions had had little experience or interest in such occupational curriculums below the baccalaureate level.

The first test of public education's ability to mount a massive effort in preparing health workers under the Federal legislation came in the development of practical nurse education. This is a familiar success story to those who were involved with the implementation of P.L. 84-911 between 1956 and 1968. The intent of Congress, as stated in the Act, was carried out. Vocational and Technical Education proved conclusively that occupational education for supportive health personnel could be established in educational institutions, could be operated in the best interests of both the students and their prospective employers, and conducted efficiently.

The Federal, State and local partnership under Title III of P.L. 84-911 in the promotion and development of education for health occupations achieved the following:

1. Rapid growth of practical nursing programs, increasing from 411 programs nationwide in 1957 to 1,245 in 1968.

2. Growth, less rapid, in training programs for health occupations other than the nursing-related ones, from an enrollment of about 900 persons in 1957 to more than 38,000 in 1958.

3. Improved quality in educational offerings serving the health occupations.

4. Health Occupations Education firmly established as an integral part of public education at secondary and post-secondary levels.

5. Increased number of teachers serving Health Occupations Education, from an estimated 1200 in 1957 to more than 6500 in 1968.

6. Professional staff positions in State education departments, assigned major responsibility for Supervision of Health Occupations Education, numbering 67 by 1968, double the number of positions in 1957. In addition, these positions are attracting education specialists from a variety of fields including nursing, physical therapy, and medical laboratory technology, among others.

7. The pattern of isolated, free-standing, single-purpose programs in a school or community is being replaced by the multi-purpose unit or department of a school in which the various health occupations curriculums are centralized and coordinated. Examples of multi-purpose units include schools of allied health, health occupations education centers, departments in community colleges and in other schools.

8. Acceleration in the movement of preparatory curriculums from service agencies into educational institutions, with cooperation between schools and health agencies in all aspects of the educational program.

More than 143,000 youths and adults enrolled in programs supported at least in part by funds under the Vocational Education Acts in 1968. Curriculum offerings ranged from nursing assistant courses to associate degree programs for dental hygiene and nursing, and teacher education for faculty serving about 25 different occupational curriculums. A selected list of 1968 enrollments by occupational goal follows:

| Curriculum | Enrollment |
|---|---|
| Dental Assistant | 8,374 |
| Dental Hygienist | 1,545 |
| Medical Laboratory Assistant | 3,994 |
| Nurse, Associate Degree | 14,812 |
| Practical (Vocational) Nurse | 62,734 |
| Medical X-Ray Technician | 1,982 |
| Dental Laboratory Technician | 1,280 |

Other curriculum offerings included medical office assistant, inhalation therapy technician, occupational therapy assistant, and surgical technician, among others. Total enrollment figures represent an increase of 22.7 percent over 1967 and, incidentally, show the largest percentage increase among the occupational fields reported under Vocational and Technical education.

More than 1,100 schools, both secondary and post-secondary, currently offer programs. Community colleges and technical institutes account for more than half of these schools. Program offerings are unevenly distributed throughout the United States, with the exception of practical nurse training which is offered in every State and most territories.

For many programs, as in radiologic technology, the transition from hospital-based to post-secondary school programs has barely begun. Many such offerings in the health field are beginning to move more rapidly into the school setting as funds, facilities, and qualified instructional personnel become available. The rapid growth of community colleges and area vocational/technical schools will greatly facilitate such transitions.

These are some of the positive features of Health Occupations Education today. Now, let us look at some of the weaknesses and needs of the program.

One might ask first, how well is the program serving the needs of the youth who need and want preparation to enter upon a health career? Secondary schools in the United States enrolled some 14 million young people in 1968. Of that total, less than 25,000 in-school youth were given some type of training in health occupations (about 0.2 percent of the total). More realistic in terms of health manpower needs would be a program serving about 10 percent of all high school youth.

Over 2,600,000 youth graduated from the nation's high schools in 1967. Total enrollments in post-secondary health occupations programs in 1968, funded by vocational education monies, was 63,584. Most of these enrollees were well beyond the age of the new high school graduate. At present level of operation, then, the program is serving only a fraction of the youth, both in and out of school, who could benefit from the opportunity to prepare for a health career.

How well does the program serve health manpower needs and are the current offerings relevant? This question is easily answered in terms of the employability of persons who complete one of the existing health occupation programs. Between 85 and 90 percent of those admitted complete their training, and at least 85 percent of the graduates who are available for employment are placed. However, one must also ask, was the program relevant in terms of the student's career aspirations and potential, or has the training locked the student into a dead-end job, in a field not to his liking, with no opportunity to shift into a related program of his choice.

A serious shortcoming in all communities is the planning needed to achieve a balanced program that serves the needs in all occupational areas. According to the Department of Health, Education, and Welfare Task Force on Health Manpower, estimated needs for dental auxiliaries, those prepared below the baccalaureate level, will be 246,400 by 1980 or an increase of 108,600. Within this group, the dental assistant category alone would require an additional 73,000 trained in the next ten years. This would require an estimated increase to 750 programs with an average of 28 students per class producing 21,000 graduates annually. Yet, in 1968, State Boards of Education reported less than 5,000 preparatory students enrolled in post-secondary dental assistant programs. Moreover, for all occupations in the health field, there are similar evidences of current and future shortages with inadequate resources to produce the numbers of qualified workers needed. A few examples of projected needs in the field, selected from the Department of Health, Education, and Welfare Task Force report, Manpower for Health-National Needs and Federal Programs, July 1969, follow:

| Programs at Less than Baccalaureate | 1980 Requirement | Increase Over 1967 |
|---|---|---|
| Medical-allied | 475,000 | 198,500 |
| Dental-allied | 246,400 | 108,600 |
| Environmental Health | 30,000 | 19,500 |

Both registered nurses and licensed practical nurses remain in short supply despite the increasing numbers of schools and larger

enrollments reported each year. Projected needs by 1975 are estimated as follows:

| | 1975 Requirement | Increase Over 1968 |
|---|---|---|
| All R.N.S. | 1,000,000 | 341,000 |
| RN-Assoc. Degree & Diploma | 600,000 | 44,000 |
| L.P.N.S. | 550,000 | 230,000 |

In 1968, State Boards for Vocational and Technical Education reported enrollments in nursing education programs as follows:

| | |
|---|---|
| Associate Degree | 14,812 (482-suppl.) |
| L.P.N. | 62,734 (13,614-suppl.) |

At present levels of output, there would be a deficit of 100,000 LPN's in 1975. The future of practical nurse education, in light of the American Nurses Association's position on nursing education, is a matter of great concern to decision-makers who administer the program of health occupations education. One can not but agree with the principle that each practitioner in health services must be prepared to function safely and effectively, and that educational opportunities to advance on the career ladder ought to be available in accord with each individual's interests and abilities. Practically speaking, leaders in nursing are aware that health services require staffing - now - and concede that the best qualified persons available must be used. They concede also, that practical nurses will be needed in large numbers for many years. Health care programs for all Americans, especially for those heretofore denied adequate medical and health care, will require full production of all types of nurses - including graduate practical nurses - and a sharp increase in schools and enrollments to produce the additional 230,000 needed.

Considering the magnitude and complexity of the total health manpower problem, vocational educators find no ready answers relative to either the current role of public vocational education in the preparation of health manpower, or its future goals in the education of health personnel at less than the baccalaureate level. A tower of Babel confronts the educational administrator as he attempts to coordinate his agency's efforts with a multitude of planning, policy-making, and standard-setting groups, not to mention legally-constituted regulatory bodies such as licensing boards. Not that the policies and standards of such groups are either undesirable or unattainable. Rather, it is the confusion and conflict, together with the lack of clearly defined worker-roles and educational standards, that concern the administrator.

There is no question but that vocational and technical education funds must be used in the years ahead to expand educational opportunities, especially in post-secondary programs, to prepare increasing numbers of people in the health occupations.

Despite the many problems in developing health occupations education within the system of vocational and technical education, the program has demonstrated in its brief twelve years of operation a growth pattern that is unique and unprecedented. It is my belief that health manpower needs will be met in 1975 only if vocational and technical education continues to support and give strong leadership in the further development of these offerings.

Major problems that have blocked the development of Health Occupations Education heretofore can and must be resolved. Among these problems, I would list the following as critical to the future development of health occupations education.

1. Fragmented curriculums operating as complete self-contained units must be re-designed and structured within broad, multi-purpose curriculums, and organized within a single department or unit of an educational institution.
2. Subject matter that is common to two or more curriculums can and should be organized to serve more than one program.
3. Analysis of functions and tasks in health occupations must be made for the purpose of identifying essential learning requirements and developing the curriculum based on the findings of such analysis.
4. Commonalities existing in the education required for various health occupations must be identified at all levels of education and functioning, and these common learnings and skills used as a basis for effecting student and worker mobility.
5. Programs that have relevance for the educational level of today's students must be developed. Today, 75 percent of youth as contrasted with 3.5 percent in 1890, graduate from high school. Students are better educated, more knowledgeable about the world around them, and better equipped with basic health information.

Much is being done through research and special projects to provide valid bases on which to effect change in present-day approaches to educating health personnel. The Research and Development Project for Curricula and Instruction in Allied Health Occupations, underway at the University of California at Los Angeles, is studying eighteen health occupations for which post-secondary education is required. Committees made up of national leaders in their respective fields are developing task analyses in such areas as nursing, medical laboratory technology, radiologic technology, among others. As the groups move through task and function analyses and identify essential learnings, modular instructional units based on the findings will be developed. Multi-media instructional packages will be prepared, tested, and made available for side dissemination.

Core curriculum is much discussed as an answer to problems in educating health manpower. Some community colleges have made progress in identifying a basic core for curriculums leading to an associate degree. One common pattern requires 18-25 hours in a basic core consisting of 12-16 credits in Physical and Biological Sciences, 3-6 credits in Behavioral Sciences, and 3 credits in the Social Sciences or Humanities. This core is in addition to the 15-21 credits in Liberal Arts required of all associate degree candidates. The occupational technology then comprises the remainder of the curriculum for each specific occupational goal.

Unlimited resources would be needed if the single-purpose curriculum pattern is continued. Yet, new and emerging occupations, as well as existing ones, will need to continue using this pattern until a basic "core" or foundation has been developed, tested, and proved to be satisfactory.

Significant contributions to the development of core content for health occupations at the high school level have been made as a result of several research and pilot projects sponsored by the U.S. Office of Education. The "Health Services and Survey" project conducted at Union Grove High School, Union Grove, Wisconsin, demonstrated the feasibility of offering a broadly-conceived vocational program that combines occupational training and work experience in a health agency with career exploration in a wide range of health occupations. Another curriculum project designed to develop and test a basic core for use in training for entry-level health occupations was completed in June of 1969 by Mrs. Sandra Rasmussen at Boston University. Similar projects have been reported by Boards of Education in many localities. Atlanta (Georgia) and Cincinnati (Ohio) were among the pioneers in developing this type of offering for high school youth.

Identification of the commonalities in curriculum content for the preparation of health workers at all levels - secondary school, post-secondary or junior college and senior college - is an essential step toward the development of core content and open-ended curriculums. Emphasis on the similarities in each curriculum rather than on unique features, solely, can help facilitate articulation between programs and faster mobility from one curriculum to another and from one level to a higher level of preparation.

Flexibility in program offerings is essential although developing slowly. Disadvantaged and handicapped persons often need special types of instruction, or a longer time to master a subject. Others, such as discharged medical corpsmen and those whose preparation was interrupted at a prior date, are demanding recognition of the knowledge and skills which they acquired in other than a particular school's curriculum. Neither our Nation or the individual student can afford the waste inherent in the requirement that course content, already mastered, be repeated.

Planning that involves all segments of the health community, as well as the utilizer of services and other decision-makers in the community, is not entirely new to vocational and technical education but must be utilized more effectively. National, State, and local advisory councils and committees representative of the various interests have been and continue to be an essential contributing force in developing health occupations education. Employers must comprise an essential part of the planning group in order to insure that the products of the program will be employed and continue to be employable. More frequently, now, the voices of the workers themselves, through their associations and unions, are being heard in the councils and committees that guide education for health occupations. Youth, also, is gaining greater recognition at the planning level today.

The Vocational Education Act of 1963 greatly reinforced the program of health occupations education with an amendment that authorized a permanent program under vocational and technical education. With expanded resources under this Act, coupled with an administrative appeal from the Department of Health, Education, and Welfare in 1966, requesting the States to give priority consideration to programs for health occupations, a strong movement to strengthen and expand offerings got underway. The States responded enthusiastically. In 1968, over 10 million dollars of Federal money, matched with 23 million dollars in State and local education funds, were expended by the States in the preparation of more than 143,000 health workers.

The 1968 Vocational Education Amendments are now providing new impetus for all vocational and technical education. This new Act emphasizes among its purposes the provision of educational opportunities, open to all who have need for education and training, that will enable them to become employed and to advance in their careers. The Act provides set-asides for several purposes but not for occupational categories. Instead, responsibility rests with State and local communities to determine where and how the funds will be spent. On the basis of identified needs and projected plans over a five-year period, priorities for training programs will be established by each State Department of Vocational and Technical Education.

A State's decision regarding educational offerings for health occupations, then, is a matter of direct concern to all in the health field and to each of us in vocational and technical education with responsibility for these offerings. Our input at the decision-making level is essential. Information needed for planning must be collected, analyzed and interpreted. In each State, a Research Coordinating Unit can provide, under the State Director of Vocational and Technical Education, leadership and expertise in gathering and synthesizing information. However, they need the help of knowledgeable health occupations educators in and outside the State. Dialogue with various

planning groups; i.e., CAMPS, Comprehensive Health Planning, Regional Medical Planning, professional organizations, and the like--must be on-going and meaningful.

The 1968 Vocational Education Amendments direct the educator's attention first to people--to the groups to be served, such as the handicapped, the disadvantaged, those in-school and those out-of-school, who are seeking and need occupational preparation. Special emphasis is placed, also, on post-secondary educational programs that prepare people for the world of work. The Act provides for a variety of mechanisms whereby special services can be provided in order that students and programs will have a better chance of succeeding. These mechanisms include work-study programs, cooperative education, research, exemplary program development, residential schools, teacher education, evaluation, and curriculum development. The Act authorizes allocation of grants to States for on-going programs of Vocational and Technical Education, and for expansion and development of new programs. A total of 565 million dollars is authorized for fiscal year 1970, with an increase to 675 million dollars for each of the two following years. Allocations to State Departments of Vocational and Technical Education would be enormously expanded under this authorization.

All parts of the Act have implications for health occupations education and should be utilized to the fullest extent in helping potential students achieve their occupational goals, and this includes students with health career goals.

As a "subsystem" within the educational system, then, health occupations education has been described in terms of its strengths and accomplishments, which are many; its problems and needs, which are complex and difficult but solvable; its responsibility for providing youth and adults with the opportunities to achieve their goals through preparation for a satisfying career in the health field; and its promise, under the 1968 Amendments, for preparing hundreds of thousands of people for employment in the health field.

In his paper entitled "Investing in Better Schools," prepared for publication in "Agenda for the Nation," Ralph W. Tyler stated:

> "Our current failure to educate approximately one-third of the youth enrolled in high school is not due primarily to the inadequacies of the students, but to the inappropriateness of the program to supply them with the kind of learning required. They are concerned with becoming independent adults, getting jobs, marrying, gaining status with their peers, and helping to solve the ills of the world."

Health Occupations Education, as an integral component of education in high schools, technical schools, community colleges, and even in

four-year colleges, offers a bright and appealing promise to youth and adults with these concerns. Our job is to make opportunities available so that quality education, at all stages of a career, is provided for all who want and can benefit from these opportunities. Through continuing efforts to build strong links between the schools, employers, and the people to be served by the schools, goals of both the health field and of people entering upon health careers in the health field will be more fully realized.

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# THE ROLE OF THE HEALTH SPECIALIST AS A TEACHER

Robert M. Tomlinson[1]

Ultimately the teacher, or that person who is the interaction agent with the learner, is the one on the firing line. In another, and most important, sense essentially every person in this room today is in one aspect a representative of a useless staff relationship kind of position because the only reason for our existing, my existing, the administration of the university existing, the state office existing, or the business office existing is to be supportive to that which happens with the individual student at the end of the process. And, that too is somewhat intermediate in this particular field since the only reason for investing the social resources, the money, the energies, the facilities, all of the rest of it, is for the payoff it will have when it results in direct patient or person service. So remember that we have to put up with all of this structure to get the job done, but the important thing is not what happens here, at this Institute.

I suspect each of you has a business office and every once in a while the business office has to be reminded that there is no good reason for their existence except as it supports the teaching-learning activities. And yet over time they tend to establish a routine and a program of their own. "We can't do that because it won't fit into our bookkeeping system." Have you ever had that kind of experience? Remember that whether you be an administrator, teacher educator, or the teacher, it all leads to one focus and that is what takes place at the action end -- the student learning.

Learning is an individual activity - no group ever learned anything. There is no such thing as learning in general. Learning is an individual activity and that's what our whole structure is about and that's where it must focus. You see, the ultimate evaluation of this institute will not be how dynamic a job I do or how the total staff performs, or by some measure of how much paper work we have. We started out with two great presentations, but they can only contribute to the learning process, your process, your individual gain. They can only contribute to it -- they can't accomplish it. Learning has to take place within the individual, you are the focus of this institute just as the student must be in the classroom. This is basically the theme of the institute.

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I'm to talk about the role of the health specialist as a teacher, and their role as a teacher educator. It was said this morning that we are a system or a complex of sub-systems all operating at the same time. Many of us have marveled on getting a man on the moon, but often we hear from the scientists, "...why can't you educators do things efficiently like we do in the sciences?" No one should be surprised about this seeming discrepancy; after all the people in the physical sciences have a very simple job -- it's not difficult. We have laws for physics, laws for electricity and they will work -- we know what they are -- we can predict. There are a limited number of variables that can be plugged in. Granted they get to be thousands and hundreds of thousands but they can be handled. There are a finite number. They operate on finite sets of principles. But, the most sophisticated computer system that has been designed is far less complex than any single individual; and he doesn't have to be too smart either. With a person you have an unknown and infinite number of variables operating at changing and unknown differential rates and directions each interposing unknown relationships. The programmer can't handle the human system as yet. This is the role of the teacher; he comes into a kind of maelstrom. We complain that the computers can't work on unknown principles, but teachers also are imperfect. They have their own...idiosyncracies, background, etc. A teacher then is a kind of individual that must stimulate, coordinate, manage in this kind of unknown situation. Even the boundaries are not known. You may try 99 approaches and you know more than you did, but none of them worked. You know that the 99 approaches tried at that time in that fashion didn't work that time. I would remind you that our number system goes far beyond 99 and that's part of the challenge. Find out -- no one can give you all the answers.

We often talk about role, image and so forth, and we all carry them around with us. To understand how they work we must take essentially a sociological approach. That's really the game we're in when we have a group, or groups, and sub-groups in an activity. We see a group to be a social activity. The individuals have some things in common. A number of people riding on a bus are simply a collection of individuals -- not a group, but when they have something in common, or many things in common, then that commonality gives them a group identity. We are different. We are different from others. There's quite a number of functions, structures, etc. involved. However, I'll not try to give you a full course in sociology. After all we have boiled down the four-year baccalaureate program and about two years of graduate work in teacher education into two weeks already. So I'm going to skip giving you a post-graduate course in sociology. Or maybe I'll try to do that in about five minutes.

I'm only outlining this approach to provide some kind of structure within which we can look at the teacher of a health specialty. We must evaluate the sociological structure within which we operate. Just

like the computer has to have a program, people have to have programs of some type, maps or models, if you will. An example of the ideal model will never actually exist but the model provides a way of thinking about things. It helps us then to pull things together and to compare what might be with what is. So we may use the sociological approach to pull together some of the kinds of things we are talking about in the health field.

The group must have some commonality of purpose and interest -- something to tie them together. For example, a group must have some kind of communication system. How do you get ideas back and forth? The individuals must use somewhat the same language so that certain kinds of words and phrases mean the same thing to each. This aspect is where many of our problems are based.

There must be a reward system to help gain the loyalty of the individuals to the group. This may involve promotion, it may involve pay, it may involve status, titles, etc. We must have, like it or not, a recognized status structure which tends to fit people along a line. The authority then is not with the individual, but the authority is within the position or the role. We may go to Max Weber's bureaucratic model for examples. With his model it's the authority of the position. In a communication something is recognized -- not because Joe Blow signed it but because Joe Blow is: Superintendent, Principal, Administrator or whatever. This concept of role and status is then built in as a component of groupness; this is a requirement of a social structure.

A value system must be agreed to. People in the group must think the same kinds of things are important. There must be some means of protection for the group, a loyalty to the group to oppose internal and external strains and stress.

There must be individuals to carry out roles within the group. Each of us play roles -- at any one time an individual can play many roles. For example, he may be a family member: father, mother, younger brother, older sister. He has an occupation and is a member of that occupation and identifies with it.

Forty people with the same occupation from forty countries arriving at the same place at the same time would have more in common to discuss, if you could eliminate the language barrier, than forty people from across forty occupations in the same country. This example gets us into the idea of groupness and identity. At any one time you are a member of many groups and you identify with these groups and your membership has relative importance to you.

The key word this morning has been "change." In the health occupations it is changing from an old to a new structure so far as

groupness, identity, values, and as occupations are concerned. Historically you would become a fuller or a millwright because you were born to that station. Under those conditions we had a great period of stability and everyone knew all occupations. Today we have a new occupational structure. Now father may be a "stud torquer" at the Ford Motor Company; it doesn't mean too much. In our present complex society we don't have the same type of identities we had before.

Each person has his own "reference groups" with which he would like to be identified, for his own status, for his own values. He will identify closer when one of these more desirable reference groups is threatened and he will "trade off" or be less identified with other groups on a priority basis. Much of this comes about through a cultural expectancy, after all we are the result of some many hundreds of years of western civilization. In other societies we might identify quite differently.

The role that each of us carry out can give status or rewards through the carrying out of that role. This is a part of what holds a group together. This concept leads us then directly to expectancies. The social system itself, the total system, has an expectancy, a generalized expectancy. We've had research over the years in which people ranked occupations on a hierarchical scale. These studies show something of a structure that we have come to expect. It was mentioned this morning that vocational guidance should begin in kindergarten, and it should. Not because the children are ready, but because disorganized vocational guidance is already taking place. Children are learning, and we have evidence that by the third or fourth grade a structure of occupational expectancy and a hierarchy ranking of occupations does exist in their thinking. Unfortunately the only contact students have to assist them in making intelligent rankings, choices, and comparisons are too often through the "community helpers approach": firemen, policemen, doctors, nurses. Their teachers know very little about the total gamut of occupations. It's not a matter of starting something, it's happening. What we need is an organized structure. We're not going to choose occupations for them, but to make sure they recognize that the health occupations and other fields exist, organized information must be available.

In our present structure, in changing times, the social expectancy of a role is fluid. It is changing. Technological and material changes are adopted into the structure much more rapidly than the "non-material." Ideas change far slower than material things and this is where we get the "gaps" that the philosophers often indicate. It is the number and magnitude of those gaps that determine the strain. They create strains in the system and within the individuals. You in the health field, or we, if I can claim to be associated with it, are probably at the point of focus for many such kinds of expectancy and changes in expectancy.

Each individual teacher of a health specialty has his own individual expectancy. He attempts to carry out the role as he sees that role should be played. We find some real conflicts here. In moving the nurse from the bedside to the role of supervisor, you had better get a big stick -- if you want to keep her there. Shortly she is back doing what she used to do--"nursing."

Take a top worker in the auto plant and make him a foreman. He has his loyalties to his former co-workers, the bargaining agents, to production. Now you make him a foreman. There is a completely new value system that he must adopt. He must give up those things he had developed to gain status, to gain the recognition of his reference groups. You ask him to cut these ties for he is now a representative of management, and he will have to get those "sons-of-guns" to get that production out. He knows where they hid all the "special devices" and he knows what they can do when they really want to. So you ask him not only to take on a new job, which is hard enough in itself, but also to unlearn and to give up those things that his whole system had told him were important. He has to take on a new role.

Each person has an image of how a role should be played and this image may or may not be compatible with the overall social expectancy, organizational expectancy, or the sub-unit expectancy. The new role may demand a type or combination of individual characteristics, values, etc., that the person in the new role simply cannot carry out. The difference in role requirements and change of identity is where we get much of the role conflict. It is most likely to happen when it comes to people who are moving from a practitioner of health specialty, or technical specialty, to teaching that specialty. The specialist must now identify as a teacher which has a whole new set of values, requirements, reference groups and rewards.

We betray or reveal ourselves, whichever the case may be, simply in our choice of words, the way we use phrases. Do you identify yourself when discussing a topic or occupation? When do you use <u>we</u> and when do you use <u>they</u>? I want to charge you to keep this distinction in mind as you go through this institute. When you are in "general" groups, when do you use <u>we</u>? When do you use <u>they</u>? It tells a lot about you and how you identify. We tend to identify with and use "we" in terms of those with whom we feel the most comfortable. It is only when you begin to say "we" in reference to the broad field that you identify with health occupations as opposed to nurses, medical technicians, or whatever. Use this as just one yardstick and see if it changes during the two weeks.

I'm sure some of <u>you</u> in this group feel a bit of insecurity, just as <u>we</u> do. After all, <u>we</u>, a bunch of educators, are going to tell <u>you</u> what to do in your field and you know your field better than we. We have some insecurity, too. Included in this group are some people with

doctor's degrees -- of several kinds -- and some without any degree. As far as I'm concerned we're all one group, in role and status. We're all learners, and we will approach it from that point of view. As an established group during a change process, change comes hard. You can move with change or you can say "these things are sacred; they always have been and we must protect them." You can close into a tighter knit group, become more and more protective in opposition to the perceived outside threat. I would suggest to you that there is only one direction that this type of reaction can go. You lose! You lose not only those things that are important to your small group, but also you lose in the total group because any combination that you might want to count as a part of your protected group will be a minority. The public will be served. I would remind you that Medicare did pass. It may take a while, but when we get the massive amount of money devoted to health care that we're talking about and when "the people" want something badly enough, they get it. Actually, the AMA -- and we may have a member or two here -- should really sue television. After all, Ben Casey and Kildare pulled the screen away from the mystical world of medicine and now any patient that walks through the door already knows what's wrong with him and just about what ought to be done about it. It's not the patient's fault. The physicians too are now in the "public domain" and had it not been for some of the things such as TV we would not have had the opportunity, as well as challenge, to consider improvement and expansion of health occupations education programs.

What are some of the special implications for teaching in the health areas? One of the immediate ones that comes up is the artificial dichotomy that really doesn't exist between content and method. There is no question that you have to know something before you can really teach it. Now this does not necessarily mean that you cannot precipitate learning activities so that the students in the long run may be smarter than their teachers -- thank God that's true. But, you still have to have something to work from and be able to communicate it in a fashion that the learner can, in fact, use as a basis for development. In this first sense when we're talking about teachers of health specialties, it's almost predetermined that they must come from a specialty field. Hence, we start with a specialist and just like the auto plant foreman, we ask this person to leave an established role and to serve at least a dual role. They are asked to give up some of those reference groups, or at least to read just priorities and strengths of relationships into a dual relationship, which may actually be seen, in this sense, as a step downward in status. Certainly in some respects it is a conflicting situation. Are they still technologists or are they teachers? It is difficult to make the choice or distinction.

It is a long continuing process until we finally have the type of person we want and must have -- a highly qualified specialist and teacher who can provide the leadership necessary, provide the desirable attitudinal aspects and to get that person to be willing to make the

change to teaching. Hopefully, they are also the ones that have the security, self-assurance, and competencies to do the kind of job that's needed, and in the teaching-learning process instill in their students the kinds of things we want them to have.

The selection and preparation of the health specialist is a long and continuous kind of process which affects the potential teacher. First, they were selected by specific criteria and with all the tradition behind the specific health specialty. After all, we accept only single, white, Catholic or Protestant (depending on the institution), females, under 18 or 20 into certain programs. These criteria alone give us a specialized group to start with. Then, the specialty program completely impregnated them with selected attitudes and views during the training process. They had to "put up with" a lot of "stuff" that most people wouldn't put up with -- and, anyone who deviated was moved out or chose to move some place else. So, we "chop off" a block through selection, and then, we polish it, and polish it some more, so that we come out with a molded individual. Do the persons with certain personal characteristics, values, and interests select the occupation, or is it the other way around? Is it the selection, preparation program or the occupation that molds the individual, or vise versa? I'm sure that it is a combination of all.

After all of this preparation and demonstrated competency in the specialty, we now ask this person to move to teaching. It's no wonder -- on a basis of probability alone -- that it is difficult to find that individual who will be an outstanding teacher in the health specialties. Simply from the required combinations of background, experience and attitude demanded by this new role. Only a small percentage of all health specialists will be able to fill the teaching role.

What are some of the conflicts in the health occupations education area? One of the special aspects involves the clinical experience. In most cases you cannot entirely simulate the necessary learning experiences within the controlled educational environment. In almost all cases you must involve an operating situation where the health services are being provided. Very often this involves services to individuals, who have values in their own right.

One of the most common things I hear from people in the health specialty fields is, "We're different, that may work all right for other education areas, but we're different." You're right! You are different! Thank God you are, but so is every other occupation. You say, "but life is involved." O.K., I'll buy that, but it is not unique! Many of you came here on an aircraft. I would remind you that those aircraft have to be maintained by someone. The mechanic that maintains that aircraft, or a fleet of aircraft, probably was prepared for his position in no more than a year or two. I would say that he makes more judgments

everyday - day in and day out - that involve more lives than probably any one of you people will make within the next five years. Now think about that as you fasten your seat belt for take-off on the way home. You're different; there is probably a different kind of relationship, not a degree but a different kind of relationship, where a person is dealing directly with another individual on a person-to-person basis. How different? I don't know, but don't try to base the argument primarily on the fact that life is involved. That, in itself, is not enough. There are other kinds of relationships.

Because you will be preparing students who will at some future time be making judgments and those judgments do involve life, you are faced with the situation where you must make a decision and say, "Yes, this person is ready. He will make the kind of judgments that will be called for." The most a teacher can do is to have such an influence on a learner that at some future decision point that student, now a practitioner, will make the required judgment at a level required in that situation. You can't foretell what that situation is going to be. You have to plan so that his decision will be of higher quality than it would have been had you not had an influence on him. The payoff is not how great you perform in the classroom, it is what happens after the student leaves you. When is the student ready? You have to make that judgment in recommending that he be graduated or certified to practice.

People in the health field put great value on the individual - they never give up. You do anything that is necessary to preserve privacy, dignity, life, safety etc. Now, when you become a teacher you are put on the firing line. You're going to have some students who just don't have it, and you're going to have to say, "I'm sorry but we're dropping you." This does not preserve the dignity of that individual regardless of how nice you say it. You can do as good a job as could possibly be done, but you're still going to have to face situations where you must make decisions that are contrary to some of the values you have developed. You will have to choose between principles. Students will have to be failed. Often, the decision will have to be made from incomplete information and without the aid of objective measures. The varied aspects of approval, licensure, certification, accreditation - or whatever - include the judgment of you as a teacher. You have the responsibility of saying "Yes, this individual as an individual and through knowledge, ethics, values, and responsibilities will perform." Two aspects are involved, competency and personal integrity, neither is adequate in or of itself. This is another of the particular problems for the health specialist who becomes a teacher.

Another problem which arises is between the patient and educational needs in the clinical location. Certain aspects of the health education learning experiences must be obtained in contact with patients. Students must learn, but what are the patients rights in the learning situation? In many cases these situations are incompatible, but you

have to face them. The choice may be between the individual and the group. How do you choose? Under what circumstances do you say that the individual is always more important than the group? And when is the group more important than the individual in your class? Both principals have to apply and be observed at one time or another.

What kinds of activities, deviations, problems can you tolerate with an individual student within the learning process? You may say to yourself, "If I can take just a little more time; If I can put up with this, then he will probably improve and be successful." What is this going to do to the rest of the group? You have to make a choice. You have to face it. As a technician, as a nurse, you can usually refer it up to that next person in charge. As a teacher, I'm sorry ladies and gentlemen, but that's <u>your</u> problem. And, you won't make all the right decisions. That, too, you'll have to accept.

Many of the functions of the health specialist teacher are like those of any other teacher who is a representative of the educational profession. In the health field one thing that makes a difference is the single specialty curriculum. The particular curriculum leads directly to a particular occupation, licensure or certification. The teacher in such a program has generally expected someone else to structure the program. "Ours not to question why but.....etc." The "word" has been handed down by the radiologist, pathologist or some other such person or group. There are such programs. You do it this way, the apprenticeship method. The responsible, professional health specialty teacher cannot function at this relatively blind level any longer. The teacher directing a program has to carry a great deal of responsibility. He must be involved with helping to define the objectives of the program, not just within the specialty but also for those courses that are related. They must be involved in developing the supportive curricular structure and what goes into it. They must be involved both in the broad fields of the technology, and teaching. They must be able to help identify problems, possibilities, roadblocks, and to initiate actions which will make changes possible. The statement that all questions are to be determined by someone up-the-line is not adequate. It is your responsibility, your role, to evaluate, to have ideas, and to make them known.

There are about three steps that help distinguish the professional or quality teacher from the rest of the crowd. Number one is to have ideas, to think. However, no one ever thought in a vacuum. You have to have the knowledge, the information with which to do this thinking, to develop ideas. The next step is that you must make the ideas known; and, third, you must support your ideas and change them if a better way can be found. To have the information, to think, to have ideas, and to support them; you've got to carry through this far. Because, if <u>you</u> don't, who's going to? Decisions are going to be made relative to

programs, allocation of resources, services -- they will be made. Too often, we wait for someone else to make them. Legislators make decisions in ignorance time after time after time. They make decisions based on the best information they have. Local advisory committees and school boards do the same thing. Too often they have no good information. You can help to provide leadership. Before you can identify yourself with, and claim to be a health specialty teacher, you must accept the obligation to have a position, make it known, and back it up. More and more we recognize that education is a part of the political process, not partisan politics; but in the public domain we operate through, and identify with groups. What is your role going to be? Receptive or Active?

The teacher who has come through the background of a health area is still identified pretty much with that health specialty. In our expanding health occupations education system the health specialty teacher will be asked to again move on to become the teacher educator or the supervisor. Again, you will be asked to give up, or lose, an identity, to move even farther from the health specialty. It's a sequential process. You must now look even more broadly at the health field, and beyond that to general education, to the values of all people, to making the decisions and establishing priorities. Where do you allocate the available resources? You are asked to initiate, precipitate, activate, act as a catalyst. You won't be able to do it all. Unfortunately, you will not know which of the actions or activities will pay off. The best you can do is take advantage of each opportunity available, to assist others, and make program improvement possible.

Remember too, that institutions (hospitals, schools), associations (AMA, unions), communities (towns, states), and many other units operate as social sub-systems. Individuals have status, rewards and roles associated with each of these sub-systems. All individual interactions, in connection with relationships among the sub-systems, must be carried out in terms of the images and expectancies of the sub-systems. There is always a potential threat to the individual and his role as well as the status and role of the sub-system in each action taken. Resistance and opposition to change is the most notable product of any proposal which may be seen as a threat to status and role; such resistance and opposition may not be logical or objective -- it is protective. A perceived threat is as important as an actual one. For each status item relinquished, a replacement must usually be found.

Social systems and the members of the systems are human -- with all their potential and limitations. Teachers are by nature and definition active interaction agents with a wide range of other individuals. To be effective they must be aware of their role and its



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requirements -- through self-evaluation and a program of professional development. It is a dynamic and demanding role -- it is not a role that everyone should attempt. For those who are successful, the rewards are unmatched.

I have chosen this role; to me it is rewarding. I am still a learner; there is more to be known than we now know about being a successful teacher. I am a little smarter than I used to be; but about every three or four days I can look back and ask, "How could I have been so naive so short a time ago."

I am sure there are many different images and expectancies for the staff of this Institute. Upon completion, each of us will have to determine whether or not we reached our role expectancy. More importantly, each of you will determine whether or not we met your expectancy.

MODULAR UNIT 2

## Defining and Describing the Educational Product

Guidelines:

Educational Objectives

Instructional Strategies

Annotated Bibliography

Supplementary Materials

"I Taught Them All"

Dear Mr. Principal

Supportive Papers:

Conceptual Models to Analyze Occupations for Educational Purposes -- Jacob Stern.

A Conceptual Model for a Specific Health Field -- Robert Tomlinson.

Writing Educational Objectives at Various Levels of Specificity -- Jacob Stern.

Objectives for Medical Education (Opthalmology) -- Bruce Spivey.

## EDUCATIONAL OBJECTIVES

2. Following completion of this modular unit, the participant will define the desired learning outcomes of the educational system.

   2.1 The participant will analyze a selected health specialty field for the purpose of developing an educational program.

      2.1.1 Differentiates between a subject area and a discipline.

      2.1.2 Distinguishes between different types and methods of curricular change.

      2.1.3 Recognizes the advantages of using a conceptual model to analyze an occupational field.

      2.1.4 Develops a conceptual model for a health specialty field.

   2.2 The participant will describe the output of an educational program in terms of the behaviors to be achieved.

      2.2.1 Recognizes the desirability of formulating educational objectives.

      2.2.2 Prepares appropriate educational objectives.

         2.2.2.1 States objectives in terms of observable student behaviors.

         2.2.2.2 Develops a series of objectives in a hierarchical order from general to specific.

         2.2.2.3 Writes properly stated objectives which are appropriate for each of three domains of behavior; i.e., cognitive, affective and psychomotor.

      2.2.3 Uses educational objectives as an integral part of the educational process.

## INSTRUCTIONAL STRATEGIES

General presentations, small group discussions and project activities comprise the strategies recommended for this unit.

Presentations on a general approach to conceptual models and a specific example for a health specialty field are seen as being most

suitable for lecture or lecture-discussion presentations. The discussion-work groups for this unit should, as much as possible, be made up of personnel with some similarity of occupational background. Following a discussion in which specific problems concerning conceptual models are resolved, the groups would be asked to develop a conceptual model for their common specialty area. After having had an opportunity to discuss and formulate a model, the entire group should be brought together to review their activities. At this time the group could be apprised of how a curricular model can lead to the development of educational objectives.

For the second portion of this activity, a lecture-discussion presentation on how to write educational objectives is suggested. This would be followed by work groups to practice writing objectives under the direction of a group leader. In an effort to gain proficiency in writing objectives and to consolidate both aspects of this unit, the participants could be asked to develop objectives for presentations such as they might make for a microteaching session. Objectives should be prepared at various levels of specificity and it would be desirable that the participants show how their objectives fit into an overall structure such as a conceptual model for a specialty field.

## ANNOTATED BIBLIOGRAPHY

Banathy, B.H. Instructional systems. Palo Alto, California: Fearon Publishers, 1968.

Banathy describes the specification of educational objectives as an integral part of the design of instructional systems. The process of formulating objectives is viewed as a gradually unfolding specification, refinement, and description of the expected output performance of the learner. Includes an excellent bibliography and several interesting flow charts.

Bloom, B.S. (Ed.) Taxonomy of educational objectives, Handbook I: Cognitive domain. New York: David McKay, 1956.

This book provides for classification of the goals of our educational system which will enable teachers to correctly classify objectives they wish to measure. Sample objectives chosen from a range of subject-matter fields are used to illustrate each of the taxonomy categories, and the Handbook includes constructive suggestions for measuring each class of objectives.

Burns, R.W."Behavioral objectives: A selected bibliography." Educational Technology, 1969, 9(4), 57-58.

This condensed list of 43 bibliographic entries covers the major aspects and points of view regarding the development and writing of

behavioral objectives. The listing is in chronological order from 1955 to 1968 inclusive.

Gagne, R.M. Educational objectives and human performance. In J.D. Krumboltz (ed.), Learning and the educational process. Chicago: Rand McNally, 1965, Pp. 1-24.

The paper begins with an exposition on the importance of stating educational objectives in terms of observable human performance. A useful element for describing behaviors is defined as the "task"-- the smallest unit of performance which has a distinct and independent purpose. Six categories of tasks are specified which have relevance to education and which may facilitate research on the conditions for their learning.

Harmon, P."Developing performance objectives in job training programs." Educational Technology, 1968, 8(22), 11-16.

Cybern Education, Inc., Xerox Education Division, Job Corps Headquarters in Washington, D.C., and the curriculum personnel of the Men's Urban Job Corps Centers were involved during 1967-68 in an effort to specify the entire vocational, basic education and social skills curricula in terms of performance objectives. This paper describes their approach to preparing performance objectives.

Harmon, P."A classification of performance objective behaviors in job training programs." Educational Technology, 1969, 9(1), 5-12.

The second in a two-part series, this paper reports work by Cybern Education Inc. and Xerox Education Division for the Job Corps Men's Urban Centers, resulting in a curriculum system with performance objectives as the primary unit. The article defines performance objectives, then distinguishes 14 types of objectives according to the type of behavioral task the student is being asked to perform. The 14 types of objectives are grouped under three general headings: verbal performance objectives, physical performance objectives and attitudinal performance objectives. Each of the 14 types is described, and the particular considerations for actually writing the various types of objectives are given.

Krathwohl, D.R., et al. Taxonomy of educational objectives, Handbook II: Affective domain. New York: David McKay, 1964.

The affective domain includes those objectives dealing with attitudes, values, interests, and appreciation. The classification scheme, as in Handbook I, is hierarchial in nature, that is, each category is assumed to involve behavior which is more complex and

abstract than the previous category. Thus the categories are arranged from simple to more complex behavior, and from concrete to more abstract behavior.

Lindvall, C.M. (Ed.) Defining educational objectives. Pittsburgh: University of Pittsburgh Press, 1964.

This report consists of papers presented at a conference held on April 16th, 1963 at the University of Pittsburgh and sponsored by the Regional Commission on Educational Coordination and the University's Coordinated Education Center. Of particular relevance are the following chapters: (2) The Importance of Specific Objectives in Curriculum Development by C.M. Lindvall, et al., (3) The Taxonomy of Educational Objectives -- its Use in Curriculum Building by D.R. Krathwohl, (4) The Implications of Instructional Objectives for Learning by R.M. Gagne, and (6) Some Persistent Questions on the Defining of Objectives by R.W. Tyler.

Mager, R.F. Preparing instructional objectives. Palo Alto, California: Fearon Publishers, 1962.

Defining specific objectives is a basic step toward successful communication in any educational program. In this exceptional book, the author effectively demonstrates how to define learning objectives, how to state them clearly, and how to measure progress in achieving them. A programmed (branching) book that is already a classic in this field.

Popham, W.J. & Baker, E.L. The following titles and descriptions are from a series of illustrated filmstrips with accompanying audio-taped narrations and instructional manuals. (Available from: Vimcet Associates P.O. Box 24714, Los Angeles, California 90024).

#1 EDUCATIONAL OBJECTIVES. This program assists one in developing precisely stated instructional goals. At its conclusion viewers are able (1) to distinguish between behaviorally and non-behaviorally stated instructional objectives and (2) convert non-behavioral objectives to a form specifying student post-instruction behavior.

#3 SELECTING APPROPRIATE EDUCATIONAL OBJECTIVES. What objectives should a teacher attempt to achieve? This program provides tools with which to answer this question. Demonstrating that mere specificity of instructional goals does not insure worthwhile goals, the program develops the viewer's skills in using modified versions of the Taxonomies of Educational Objectives.

#8 A CURRICULUM RATIONALE. Emphasizing the importance of selecting defensible objectives, this program describes the essentials of Ralph Tyler's approach to curriculum building. The viewer is given practice in employing the major components of the Tyler model.

#9 DEFINING CONTENT FOR OBJECTIVES. In this program the application of behavioral objectives is made feasible in an ordinary classroom situation. Teachers are taught that operational objectives should specify content that is generalizable beyond a single text item. The viewer learns to identify objectives which do and do not exemplify content generality and to write objectives which do.

#10 IDENTIFYING AFFECTIVE OBJECTIVES. Perhaps the most difficult task of those who must formulate objectives is the generation of affective objectives. This program provides a four step strategy for designing affective objectives and gives the viewer practice in using the strategy.

#11 ANALYZING LEARNING OUTCOMES. In this program techniques of task analysis are applied to learning objectives. Practice is provided so that an operational objective can be analyzed into subtasks, designated as either entry or en route skills. Use of a particular strategy is advocated in which instruction is approached in terms of learners' response rather than teacher presentations.

Popham, W.J., Eisner, E.W., & Sullivan, H.J. Instructional objectives: An analysis of emerging issues. Chicago: Rand, McNally, 1969.

Many important issues associated with instructional objectives have been raised during the past several years. This monograph discusses these issues in an open educational forum consisting of four papers and a discussion of each.

Simpson, E.J. The classification of educational objectives, psychomotor domain. Illinois Teacher of Home Economics, 1966, 10(4), 110-144.

A scheme for classifying educational objectives in the psychomotor domain was developed. The general procedures included: (1) A comprehensive review of related literature, (2) the collection and analysis of behavioral objectives of the domain, (3) laboratory analysis of certain tasks to discover by observation and introspection, (4) the nature of the psychomotor activity involved, and (5) conferences with scholars who had specialized knowledge of the domain. The tentative classification system is presented in taxonomic form in the conclusion of the report.

Tuckman, B.W. Manual for evaluating educational programs - The Check Technique. New Brunswick, New Jersey: Rutgers - The State University, 1968.

This publication resulted from a U.S. Office of Education funded project designed to find ways of evaluating whether pilot programs lead to increased knowledge and/or skills for those exposed to the programs. The author contends that if achievement measures are content valid they can provide a means to evaluate programs. To assure that evaluation devices are valid, the author makes the point that detailed objectives, task analysis, developing test items, and the scoring and interpretation of test results are covered.

Veduin, J.R. Jr. (Ed.) Conceptual models in teacher education. Washington, D.C.: The American Association of Colleges for Teacher Education, 1967.

This resource book is a compilation of papers by leading educational researchers and theoreticians. The purpose of the publication was to draw together some of the specialist's best work to provide background and stimulation for the development of new and different patterns for preparing teachers.

## SUPPLEMENTARY MATERIALS

### "I Taught Them All"

I have taught in high school for ten years. During that time I have given assignments, among others, to a murderer, an evangelist, a pugilist, a thief, and an imbecile.

The murderer was a quiet little boy who sat on the front seat and regarded me with pale blue eyes; the evangelist, easily the most popular boy in school, had the lead in the junior play; the pugilist lounged by the window and let loose at intervals a raucous laugh that startled even the geraniums; the thief was a gay hearted Lothario with a song on his lips; and the imbecile a soft-eyed little animal seeking the shadows.

The murder awaits death in the state penitentiary; the evangelist has lain a year now in the village churchyard; the pugilist lost an eye in a brawl in Hong Kong; the thief, by standing on tiptoe, can see the windows of my room from the county jail; and the once gentle-eyed little moron beats his head against a padded wall in the state asylum.

All of these pupils once sat in my room, sat and looked at me gravely across worn brown desks. I must have been a great help to these pupils--I taught them the rhyming scheme of the Elizabethan sonnet and how to diagram a complex sentence.

- Naomi J. White

## Dear Mr. Principal

DEAR Mr. Principal:

Are you still running the harmless, gentle, unnatural institution you did when I was a student in 1930?

Married in '33, on relief in '34, I did not know how to do what was required by those with jobs to offer. There was no demand for factoring or geometrical demonstrations, for translations of Caesar or Cicero. My knowledge of Wordsworth, my history, did not function. I found no one who spoke my language. Why did you not teach me the language that is right for meeting the kinds of people I have to meet when looking for a job or trying to sell cars? Essays seem to be confined to educational institutions.

In fairness, I did get something. On the athletic field I learned to take it on the chin, and to protect myself, and I also learned many valuable lessons in good sportsmanship and fairplay.

I wish I had been taught more about family relationships, child care, getting along with people, interpreting the news, news writing, paying off a small mortgage, household mechanics, politics, local government, the chemistry of food, carpentry, how to budget and live within that budget, the value of insurance, how to figure interest when borrowing money and paying it back in installments, how to enjoy opera over the radio, how to detect shoddy goods, how to distinguish a political demagogue from a statesman, how to grow a garden, how to paint a house, how to get a job, how to be vigorous and healthy, how to be interesting to others, how to be popular, how to be thrifty, how to resist high pressure salesmanship, how to buy economically and intelligently, and the danger of buying on the installment plan.

How did you expect me to solve these and countless other real everyday life problems with what you gave me? Or did you? Here's hoping that your faith which seemed so unbounded in four years of math, history, Latin and your kind of English, has weakened; and here's hoping again that you will learn about life as it is really lived so that you may teach it to those who now fill your halls.

Sincerely yours,

GRADUATE

- Author Unknown

# CONCEPTUAL MODELS TO ANALYZE OCCUPATIONS FOR EDUCATIONAL PURPOSES

Jacob Stern[1]

You know, you never know when it's going to break out in an institute like this. Mrs. Gillespie came through like a real trouper this morning, and so early in the game. You know it's going to happen, but you don't know how, when or where. Yesterday, I think it was Lew Holloway's analogy to birth and today it's Mrs. Gillespie's report on Group 5.

This has caused me to ponder over my topic a little bit, because of the way I tend to organize my thoughts and the way my bizarre mind seems to work sometimes. It may well be that we will be going from the sublime to the ridiculous and likewise, you might also say from the real to the abstract. What we've been talking about for the last day or day and a half now have been the real problems, insofar as reality is in fact reality. What I'd like to do this morning is to step back and look at some generalized models of reality and perhaps that, in reflection, can help us perceive our problems in better perspective, a more systematic perspective. That's the role that I've been assigned, or carved out for myself; the one that gives me pleasure and my students pain, I think. It has been said that the final test of any construct or classification system, any generalized approach in looking at a problem or phenomenon, is dependent upon the purpose for which that classification is going to be used. I want to preface what I'm going to say with an emphasis on the purpose. We will be looking at conceptual models to analyze occupational fields for educational purposes. The reason we've been very much concerned about this is that any field that is in a state of dynamism, a state of flux, casts about for constructs, for organizing principles that can draw those loose ends together that seem to be shooting off in all directions. We are hurrying to try to catch up with it and make some sense out of it, some new sense in terms of the changes that are taking place. Any field that catches itself in this kind of condition must be wary of one of the first pitfalls, and that is, picking up a classification system or a construct that was designed for some other purpose. It may have been appropriate for that other purpose, but it may be a real shoehorn job to get this new dynamic field to fit the structure designed for some other purpose. So I want to use that as a note of caution as I go through some of these factors I've thought about in response to the question of conceptual models to analyze occupational fields for educational purposes.

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There isn't too much of an order or hierarchy in the ten factors that I want to discuss now. I'll come back to them and use them in a different way before we're through this morning, but first I want to discuss each one briefly. We can look at certain occupational fields, by task analysis, by looking at the different activities that practitioners in that field engage in; and in doing so we can develop what I have come to call a matrix of complexity and frequency. For complexity you stop a practitioner at any point in time and say, "Please rank this task you are now performing in terms of complexity in comparison with other tasks that you normally perform." Thus we can get a picture arranged -- high, moderate or low complexity. Now, we'll ask him the second question, "please rate the task in terms of the frequency with which it occurs." In this fashion one constructs a complexity-frequency matrix. We'll deal with this matrix a little bit later in a different way.

Another factor that I want to call to your attention in connection with conceptual models of this sort, is what I call the volatility of the occupational field. Now, by volatility of the occupational field, I mean the rate, kind and direction of change that the field is undergoing. It may be technical change. If it is an accelerated rate of change, I call it a highly volatile occupational field.

The next factor I want to deal with is the taxonomies. You know the Bloom taxonomy of educational objectives in the cognitive domain, the Kratwohl taxonomy of educational objectives in the affective domain, the Simpson et al taxonomy on objectives in the psychomotor domain and other similar taxonomies of behavior. I want to make this point real clear because I want to put two things together in this presentation that I do not think have been put together before. The taxonomies of educational objectives are a way of looking at occupational fields. We can look at an occupational field, watch a practitioner and we can say he is now behaving in a cognitive dimension. He is now behaving in an affective dimension, or he is now behaving in a psychomotor dimension. O.K., that's part of it. Another factor that I want to discuss is the Dictionary of Occupational Titles (D.O.T.) classification which says that a person works with information, or he works with people, or he works with things. If you know the D.O.T. classification system, they've got a nine point scale and if a person works predominately with, or if the level of his performance is particularly high with regard to people, I think they rate him a 9, and that's the highest category. They have a similar hierarchical structure for the other categories, things and data. Later on, we are going to put the taxonomies, which are behaviorally oriented, and the D.O.T. classification system of data, people and things together and see what type of matrix will come out of that.

Now, another factor I see when looking at occupations that seems intriguing and of some importance for curriculum decisions is the degree

of uniformity found within an occupational field. This means to me that if I am an automobile mechanic and I want to take a job in Cleveland, Ohio, will I find that the expectations, conditions of employment, etc., etc., are similar in Cleveland to what they are in Iowa City or wherever I might happen to be. I call that the degree of uniformity and I think it's very important and something that we have often overlooked. In some fields I think it becomes necessary for practitioners to undergo substantial adjustment periods in order to make such a transition.

Two other factors which go together in my list of factors are the reward system and the risks entailed. I like to put those together because too often we become myopic about the rewards and blind to the risks. The risks are, in effect, the penalty you pay for the rewards. When looking at the question of rewards, one can ask the question about the tangibility of rewards; how tangible are they? One can ask what kind of rewards are we talking about? Is this something that we may have to wait ten years to obtain? Are the rewards intrinsic or extrinsic, that is to say, do they emerge from the activity itself or are they derived from considerations completely divorced from the action in the occupation? I want to include in the reward system and also in the risk system the question of social status and social efforts, because that is also an aspect of the reward system that we often do not carefully consider and it is very important for educational purposes.

All of these factors have some educational significance, some significance for curriculum development, for planning and operating instructional programs. As far as the risks are concerned, the companion of rewards, we have the question of the severity of the risks. How catastrophic are the potential risks? I'm always reminded of the blurb I received on a document produced by some research organization describing the research report that had recently been released. It was entitled, something like, Catastrophe Detection by Non-Parametric Statistical Means in a Closed System. I think I understand why I'm not really concerned about this topic, but the catastrophe detection part, that really got to me. That's an important thing. If I had one of those in my kitchen drawer it would tell me when a catastrophe was imminent and I'd be in good shape. I took that blurb and sent it to my dean, because I think every dean should have a catastrophe detection system too. At the bottom I wrote a note that said, "Say don't you think this is a damn good idea and something we ought to have around here?" He wrote me back and said, "You're right, Jake, now if we only knew what a catastrophe was." So, we need to know what the severity of the risks are. The risks are certainly a factor and they have substantial significance for us in motivating students and in recruiting; this significance for us in terms of educational integrity.

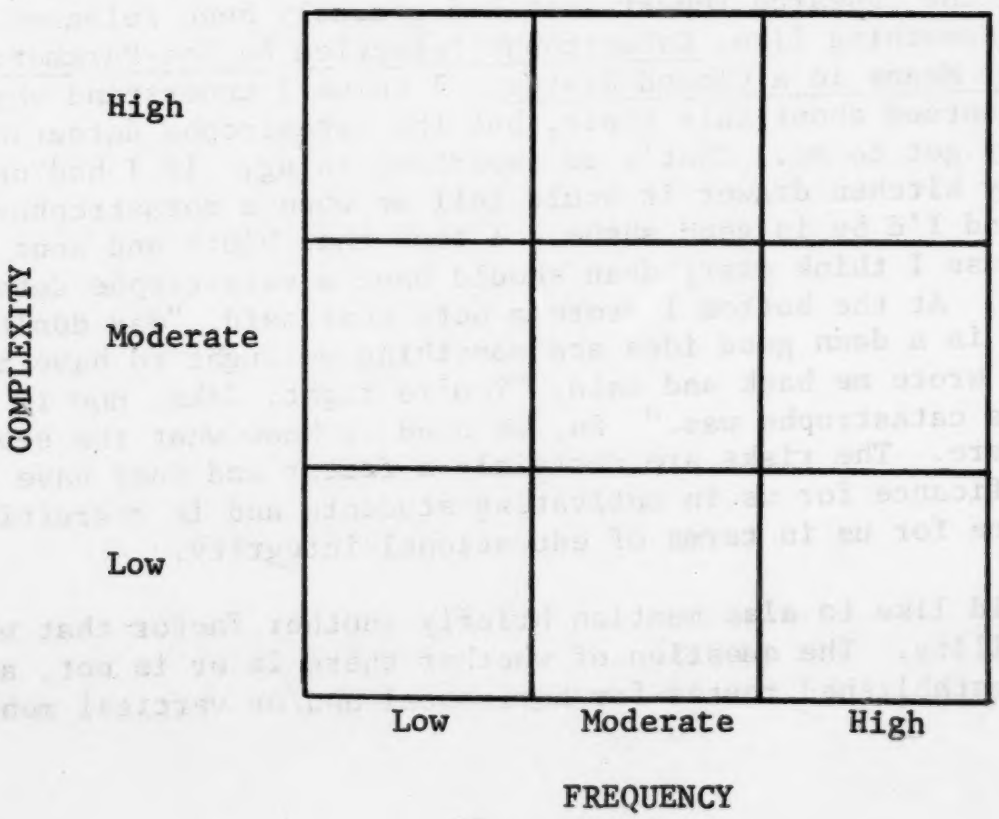
I would like to also mention briefly another factor that we call transferability. The question of whether there is or is not, are or are not, well established routes for horizontal and/or vertical mobility.

This is of obvious importance for us as we look at occupational fields. Another item that I think has not received adequate attention, maybe it has not been formulated this way, is to ask ourselves with respect to an occupational field whether successful performance in that field is based upon mastery of an art and/or a science. I used the term science here in a rather loose sense. I want to define science as an organized body of knowledge and art as a series or collection of techniques which are not systematized in the sense of an organized body of knowledge. It is imperative for us as educational planners and as people who are interested in improving the teaching-learning process to know whether the occupational fields for which we purport to prepare people, are primarily based upon an art and/or a science.

The final factor that I have identified is the one that I call social priority. We are going to talk more about social priority later this week when we talk about social forces and their impact on curricula. For social priority we can look at one occupational field and say on any list of social priorities this particular occupational field, irrespective of all these other factors, is very important and we are going to have to make some real strides in that direction. Or, on the other hand, we may look at another occupational field and say this is just not on anybody's social priority list -- it's way down on the social priority list, so we don't have to worry too much about it.

Now, I want to come back and show how each of these factors relate to educational decision making. When we talk about the complexity-frequency matrix it's really nothing fancy. We take complexity, move it one direction and frequency in the other direction (Figure 1).

FIGURE 1



We have high, moderate and low in both directions. If we take any occupational field and stop a practitioner at any point in time it is possible to determine the degree of complexity and frequency for the activity being performed. I call this particular construct the "Uncle Sam" construct. The reason for that is my wife has an uncle named Sam who is a tailor. I was involved in a curriculum research project at one time and was doing some theoretical work with regard to service occupations. I had him out one day and said to him, "Hey Sam, what do you think about this?" I talked to him about the development of the service field and an analysis of the service occupations. He said, "Now wait a minute. A man came into my shop today and he had a pair of trousers and wanted me to repair them. Well, the back pocket had been ripped clean out. He said this fellow was downtown, he'd gone to a movie and after he came out of the movie, two guys jumped him. One guy held him and the other one grabbed the pocket and yanked it out, wallet and all. In four years of tailoring he said that job occurred only one time, it's a very, very infrequent job. Most of the time, when something like that happens most people throw the trousers away but this man wanted them." That was a very infrequent job, or relatively high complexity. We then went through all his jobs like letting out the waist, lowering the length of the trousers or putting in a new zipper or whatever the case may be and he did an analysis of his own occupational field based on complexity and frequency, so I call that the "Uncle Sam" matrix.

Of what use is this to us? One of the things that it can do is to give us some insight into sequencing of learning experiences. We fill this matrix up with jobs; we can number them or call them off by name. If we have limited resources of time, money, instructors, etc., we will probably go to the high frequency-low complexity jobs first. Then if the student should terminate at the end of two weeks, two months, two years, whatever the case may be, he will have had the high frequency jobs and at least the likelihood of being successful in an entry level job is enhanced.

We can also draw certain conclusions about the designing of facilities, based on an analysis of this sort. For example, if I discover that certain activities within the occupational field are of high complexity, extremely low frequency and very expensive, I'll decide that there are other things I've got to provide for first. For example, in my own field the use of some laser equipment for measuring. The frequency with which laser equipment will be used for measurement purposes in this particular occupational field is extremely low. The equipment is extremely expensive, so I can help to resolve that dilemma for myself by developing an array like this. It helps me in my decision making with regard to facilities, equipment provision, etc.

I want to go back to this question of volatility. Remember I talked about the volatility of an occupational field which means the

rate, kind of direction of change that a field is undergoing. This factor of volatility, helps us to understand what I call the confidence level that I have in my instructional program. As Smokey says, this bears repeating. Let's say I'm bird hunting and would like to have only one hole, as small as possible, in that bird when I bring it down. The confidence that I have in my ability to hit the mark will give me some indication of how broad a pattern of buckshot I need to use. If I am a dead eye marksman, I don't want to use that, I just want a single pellet and in the right place. This is a function of my confidence in my ability to identify all variables in the situation to come up with the right mix and be precisely on target. This is what I mean by confidence factor.

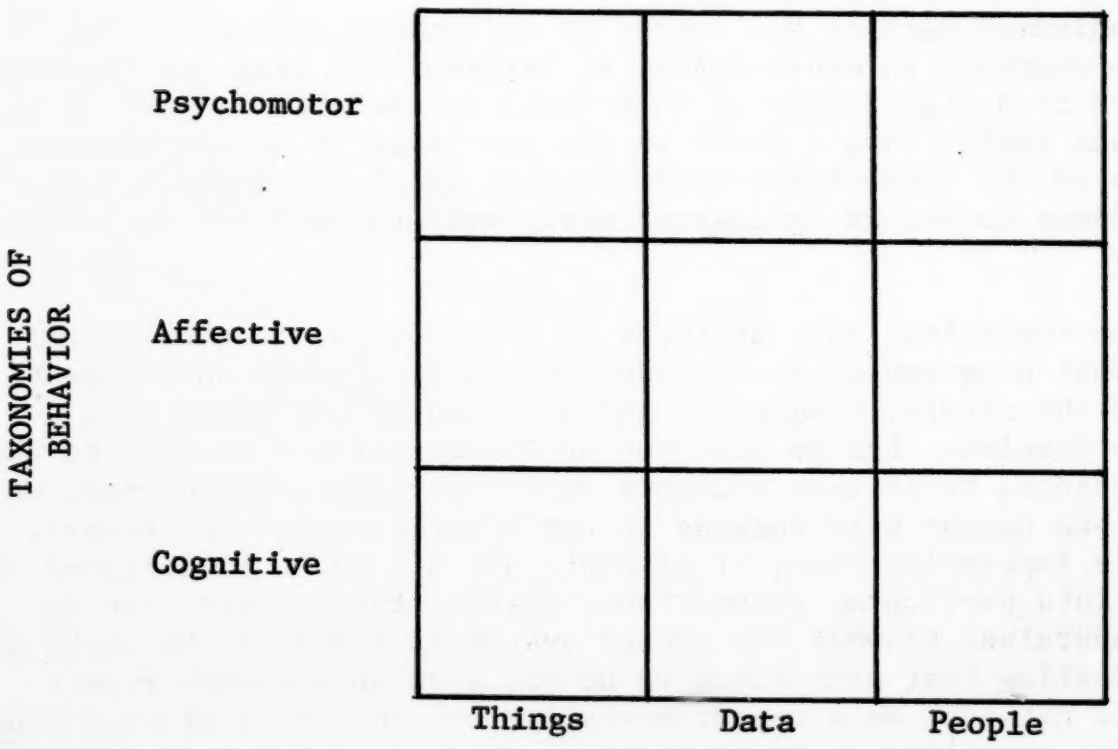
Let's translate this into educational terms. Say we have a whole array of educational objectives; some are extremely specific and some are extremely general. If you can picture for yourself a ladder structure of educational objectives of this sort from the general to the specific and you must ask yourself at which level in this ladder do you have confidence. Is your instruction pitched at the proper level? You can pitch it at the ultimate in specificity, but you're way down there working with specific models of equipment, etc. Is that kind of detail you should aim at? Is that what you're after? Is that what your confidence level justifies? Or, should it be somewhere above that?

I'll spend more time with that tomorrow when we cover objectives, but now I want to introduce the confidence factor because the volatility of an occupational field helps us to determine our confidence in a particular level of instruction. If the occupational field is an extremely volatile one, our confidence in what to teach must go down. If we don't know what changes are going to take place tomorrow, we must move to a higher level of generality. So there is an influence between the volatility factor and the confidence factor. This has overtones for facility, equipment and teacher selection. Obviously, if the volatility factor is very high, then an inordinate investment in plant and equipment is not justifiable because, tomorrow or the next day a lot of that equipment is going to be obsolete. We must make an assessment of the volatility of the occupational field.

I don't know if this will be of any particular value to you or not, but that doesn't bother me because I've found people making some of the strangest uses of the matrices and constructs that I have developed. I never dreamed that they were going to use them in that way. This is a matrix that seeks to wed, if you please, the taxonomies and the D.O.T. (Figure 2). On the left hand side, we'll have taxonomies -- cognitive, affective, and psychomotor. The fact that I put psychomotor on top of the others does not reveal any bias. The other dimension for this matrix is what I call the objects of behavior. Now, here's where the D.O.T. helps me out. The objects of behavior are things, data and people. What this in effect says, is that for any occupational field

a person may be engaging in psychomotor behavior with respect to things, data or people, and this helps me because it makes a difference whether a person's behavior is psychomotor behavior with respect to people or psychomotor behavior with respect to things. An automobile mechanic primarily engages in psychomotor behavior with respect to automobiles and tools.

FIGURE 2




OBJECTS OF BEHAVIOR

A person can look at an occupational field and say, with respect to this particular field, we have these kinds of activities that are engaged in. This activity is an example of a person's behaving in the affective domain, vis-a-vis things. Can people act in the affective domain vis-a-vis things? You bet they can! You talk to any of the aviation mechanics that we have down at the Aviation Institute at the University of Illinois. Their first love, and perhaps their only love, will be the airplane. There's something that happens to them. If you try to subsume this into the cognitive or psychomotor and ignore the affective domain, you're making a horrible mistake in analyzing an occupational field. I've taken examples from some occupational fields that I thought would be helpful to me and I see that auto mechanics, the health related fields or any others can be analyzed in terms of this kind of two-part analysis. Now, what this means to you, I don't know. I like it because it helps me to understand something that has been puzzling me for a long time. It always seemed that there was something missing in the taxonomies. Now, it's possible for a person to say I behave in an affective and cognitive manner with respect to people. It makes some difference to me and I hope it might be of some help as we try to improve instructional programs.

I think that it's important that we be aware of the fact that each occupational field and the subfields within it have certain affective dimensions that are not often acknowledged. The three domains are not mutually exclusive. This is for analysis purposes only. It helps us to understand. I do not think it is possible to behave in a purely cognitive fashion. When somebody sits down with a pipe and reflects, there is some interaction here between the cognitive and the psychomotor, I'm sure. But I don't want to bother about that now.

As indicated earlier the degree of uniformity influences the competence factor. In other words, if between Iowa City and Cleveland, Ohio, there is a high degree of uniformity in the expectations in an occupational field, then I think we are justified in having greater confidence in the specificity with which we pitch our instructions. So the confidence factor is influenced positively by positive increments in uniformity.

One of the things that disturbs me considerably is that in our instructional programs we do not systematically prepare our students to understand the nature, frequency, and so forth of the risks that a reward may involve. Let me give you an illustration. We try, to the degree possible, to protect students from the risks. Oftentimes, we are less than honest with regards to our description of the reward. I think it is imperative that, if students are not to be misdirected or misguided into particular occupational fields, they should have an accurate appraisal of what the reward system is and what the risks are. I have a feeling that many times we do not give an accurate report. This should not just be a report verbally, but the instructional program should be so contrived as to simulate or show, to the degree possible, the realities of the reward and risks system.

Transferability, the factor which indicates whether there are well-established routes for horizontal and vertical mobility, also reflects upon the confidence factor. If there are well-defined routes for transferability, we are justified in having greater confidence in our curriculum decisions.

I want to dwell on social priorities for a few moments. Because of persistent and severe social problems a particular occupational field is sometimes given a high priority rating. The instructional program is then pitched at a higher level of confidence than it would if this were not such a high priority social item. I have to be real careful about this. For example, we're in the midst of a war and we need riveters. The volatility of the riveting occupation is normally high. The rate of change, kinds of change in that occupation is so great that they are going to be instructing people who are doomed to obsolescence. We know that after a few short years, their skill will no longer be needed; but, we say it's a matter of survival. We must have aircraft, therefore, we must sacrifice the students in the sense that

we are preparing them, knowing full well that their skills will be obsolete in a short time. We must prepare them because the social priority is of such magnitude that this is a reasonable expectation. This is kind of a touchy question, but it is one that we must confront because all social institutions are expected to respond to social priorities.

Previously I indicated that one of the factors had to do with whether the occupation depended, for successful performance, upon the mastery of some arts and/or sciences. Remember, that I used the term sciences in a broader context than perhaps is typically used, to include all organized bodies of knowledge. When you talk to an artist, and say, "How do you know when to put the line here or to put the line there?" If the artist is polite, he'll just say, "Well, I just see it in my head," or something like that. If the artist is not polite and you're persistent, he'll say, "You can't understand, there's no way to explain it to you, we can't communicate." So there is a distinction between this kind of esoteric basis for knowledge as against the systematized, organized, codified basis for knowledge. Yet occupations are based on either or both of these. Sometimes, some of the practitioners attempt to make the activities more esoteric than they need be; make more of an art out of it when it could well be codified to enhance the problem of production. This is something we have to be careful about.

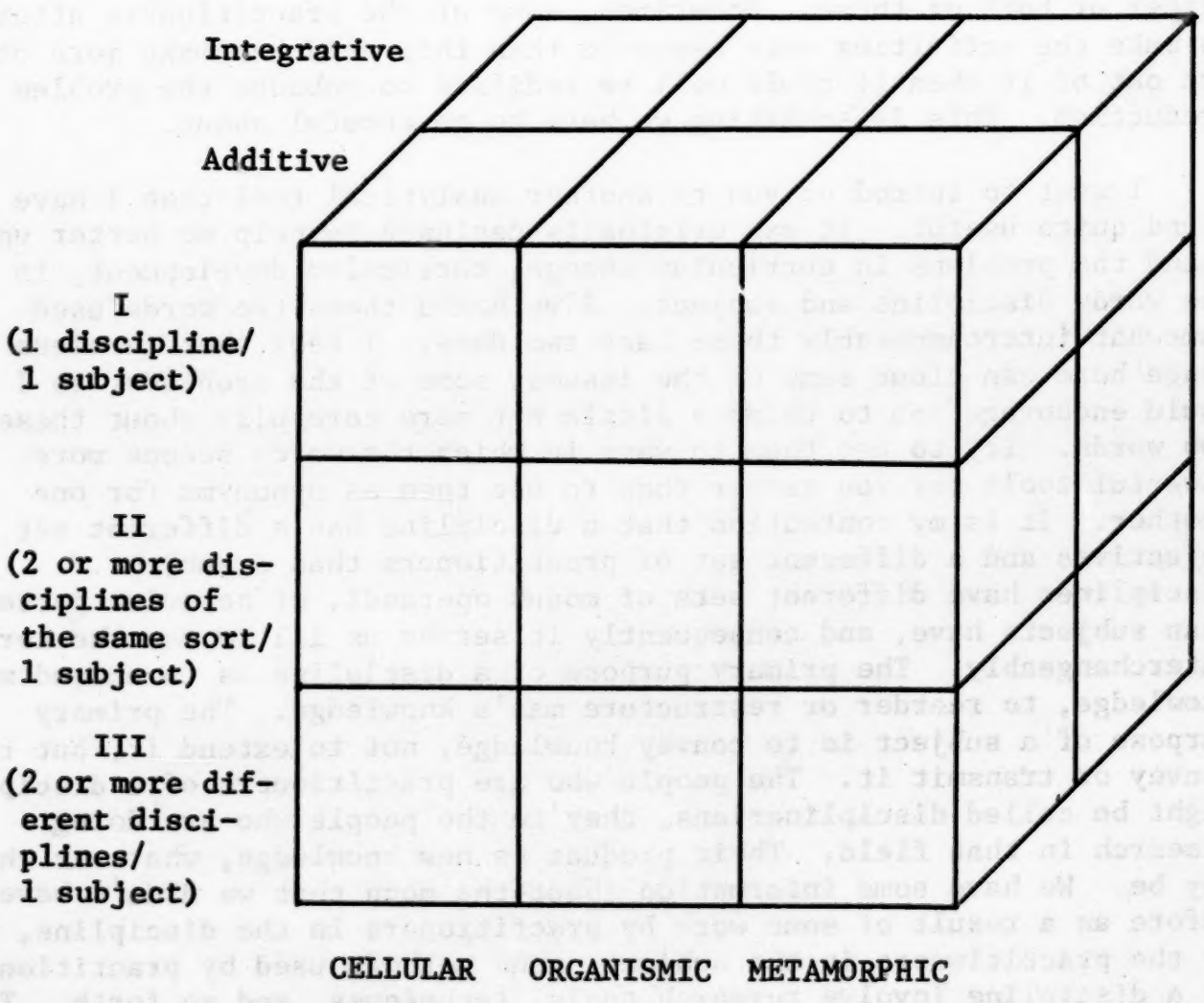
I want to introduce you to another analytical tool that I have found quite useful. It was originally designed to help me better understand the problems in curriculum change, curriculum development, is the words discipline and subject. I've heard these two words used somewhat interchangeably these last two days. I feel that careless usage here can cloud some of the issues, some of the problems, so I would encourage you to think a little bit more carefully about these two words. Try to use them in ways in which the words become more powerful tools for you rather than to use them as synonyms for one another. It is my contention that a discipline has a different set of objectives and a different set of practitioners than a subject. Disciplines have different sets of modus operandi, of behavior patterns, than subjects have, and consequently it serves us ill to use the terms interchangeably. The primary purpose of a discipline is to extend man's knowledge, to reorder or restructure man's knowledge. The primary purpose of a subject is to convey knowledge, not to extend it, but to convey or transmit it. The people who are practitioners of a discipline might be called disciplinarians, they're the people who are doing research in that field. Their product is new knowledge, whatever that may be. We have some information about the moon that we didn't have before as a result of some work by practitioners in the discipline, not by the practitioners in the subject. The methods used by practitioners in a discipline involve research tools, techniques, and so forth. The methods used by the people who teach the subject are instructional methods which are completely different from those used by the

researchers. So, I want to make this distinction. The two come together, I maintain, at the advanced level of doctoral studies, typically we find the student wearing two hats interchangeably. One moment he's a researcher in the field pushing the frontiers of new knowledge; the next moment he is a learner, studying a subject with some teacher who is helping him learn. The interchange of hats increases in frequency to the point where you can hardly tell anymore whether he is a researcher or a student.

With the thought in mind, that it is possible to make distinctions between subjects and disciplines I'm going to identify three different types of subjects -- type I, type II and type III (Figure 3). This

FIGURE 3

CURRICULUM CHANGE MATRIX



dimension on the curriculum change matrix represents the relationship between subjects and disciplines. A type I subject is a subject that draws its content, fundamentally, from a single discipline. A good example here is college algebra. College algebra is a subject which draws its content from a discipline called mathematics. One subject, one discipline. Now this is not to say that any given subject may now draw content from other fields for embellishment purposes. For example, if we are teaching college algebra, it may be nice to dip into some aspect of the historical development of algebra or to work engineering problems, but the fundamental source of content for that subject is mathematics.

Type II subjects are those which draw content from two or more disciplines of the same sort. Here I've taken some liberties with disciplines in that I am categorizing or sorting them, but this has been done since Plato's time. First we have the formal disciplines such as mathematics and linguistics. We also have the descriptive disciplines, which are sciences, basically -- physical and behavioral. The prescriptive disciplines tell us what is good, true and beautiful -- humanities, philosophy are examples of such disciplines. Then, we have what may be referred to as the practical disciplines or the sciences of efficient action. A type II subject which draws its content from two or more disciplines of the same kind would be social studies in the high schools. There is no discipline called social studies, but it draws its content from the disciplines of sociology, anthropology, psychology, etc. We have a subject in the secondary school called Physical Science 101 or something like that. Now there is no discipline called physical science, but physical science, as a school subject, draws its content from physics, chemistry, etc.

Now we come to a type III subject which draws from two or more disciplines of different kinds. Now that's a different ball game from either of the two previous subjects. You and I, and all the other people who deal with the occupational world, insofar as education is concerned, are in that ball game. We must draw content from two or more disciplines of different kinds. This means that we may have some content which is mathematical in character; maybe algebraic, that draws its content from the formal discipline of mathematics. We may also have content that is drawn from the disciplines that are descriptive in kind, maybe the physical sciences as a case in point. Sometimes we draw content from disciplines which are prescriptive in kind; that tell us what we should do and what we shouldn't do. The health occupations field is excellent to illustrate one where the prescriptive and descriptive are deeply embedded in the selection of content. With this thought in mind we can readily see the problems of curriculum development, curriculum change, in a type III subject. I hate to use the words "infinitely greater than," or "infinitely more complex than," but problems in the type III classification are certainly substantially more complex than the problems of curriculum development in a type I subject.

The practitioner of a type I subject, that is the teacher, must relate only with one person; that is, the practitioner in the discipline. The algebra teacher relates to the mathematician, that's it. In the case of a type II subject, the problem is more complex. The social studies teacher must relate with the sociologist, the anthropologist, the geographer, and the psychologist. They all are involved in the same kind of activity, but they have different domains within it. The teacher in a type III subject has a very complex task, and that is to identify and organize content. It means that he or she must relate to people from diverse disciplines. To even talk with them intelligently with such a wide variety of disciplines, is in itself, a real monumental task. One can see why curriculum development in the contemporary usage of the term was initiated in mathematics. Why was Max Beberman at the University of Illinois right at the cutting edge? Why did he begin this modern way of curriculum reform? Well, it's simple. We start where it's easier -- one subject, one discipline. We went then to the era of Zacharias in Physical Science (PSSC). What type of subjects? Type II subjects, that draw their content from two or more disciplines of the same kind. If you please, we are now in the era of the type III subject, and now is when it really gets sticky. So come on and help us; we need the help.

This then is one dimension of this matrix (Figure 3); an attempt to clarify the relationships between subjects and disciplines. I like to put this matrix up, particularly when I have people in the audience who control the money. It's obvious to me and it should be obvious to you, that we need a lot more money to get this job done than you ever did in the previously mentioned areas. Anybody who has been engaged in a substantial curriculum project in a type III subject realizes what a tremendous terminological problem it is, to just interrelate with people with the disciplinarians. I want to add a second dimension to this matrix. I call this the magnitude of curriculum change. This is a kind of continuum more than it is a set of discrete cells. Looking at this continuum, we have what you might call itsy bitsy, teeny weeny units of change. On the other end you have massive, what I call metamorphic, change. I call the smallest change cellular or unitary changes, the in-between ones, organistic changes and the larger changes metamorphic. The way I interpret this is that in cellular change we are simply changing a unit within a course; in organistic changes, we are talking about changing the whole course within a program. In metamorphic changes I am talking about changing the complete program, possibly a totally new program in teacher education. Once again the complexity of curriculum change increases astronomically or geometrically as you move from a cellular to a metamorphic change. Numerically, the overwhelming majority of changes occur in the cellular category; the teacher does this and hardly anybody knows about it.

The third dimension I want to add to this matrix has to do with whether the artificial heart is accepted or rejected by the system.

I call it the mode of adaptation of the system to change. How does the system react to change? What kind of mode of adaptation does it have? I see basically two modes -- one that I call the additive mode and one called the integrative mode. The additive mode simply says that we will add this and subtract that. Just pull out either this unit or that unit and I'll plug in this unit and I leave everything else the way it was. Or, it could be merely subtractive. In the case of integrative, however, it means that when I have introduced this change, something else side by side with it is going to be affected somehow or other, probably deliberately. It has some interesting possibilities. Say I introduce a change by adding electronic data processing to a course in business arithmetic in a program for the preparation of bookkeepers. I've got a unit where I'm introducing electronic data processing. So, it's a cellular change -- I'm introducing a unit, a part of a course that prepares bookkeepers. The question is whether it is additive or integrative. Now, if nothing else happens but to add that unit on electronic data processing, then that's additive. If I should go to my science teacher or my shop teacher and I say, "Listen, you teach electronics, don't you? Why don't you do something in this course in electronics to help my students better understand what the heart and soul of this keysorter is?" If this happens then the change is integrative. It is not just introducing change in isolation, but it's taking that change and saying, "O.K., what are the implications for this or what are the implications for that." I go two ways with that. I go what I call horizontal and vertical. Horizontal integration means to me something is happening side by side with the change that is designed to adapt the system to the change. Vertical integration is something that has happened previous to or following the addition of this new unit. Maybe the next year, because of this change the student can take something different. Or, maybe prior to the change he will have more mathematics. This then is the matrix that I use for helping me to understand curriculum change.

I played around last night with the possibility of deleting the word curriculum and seeing what would happen if I inserted the word occupational field. Since I believed originally that this model would generalize to any social change, I still do. I tried it out with occupational fields and it has some interesting possibilities right there. If you just forget about the educational programs completely and look at the occupational field, it is possible to look at changes in the occupational field on a scale of magnitude. It is possible to categorize occupational fields in a similar way to type I, type II and type III. The mathematician is an example of a type I occupation. Also, it is possible to look at the mode of adaptation of the occupation to the change in the occupation in the same way as we have done with educational programs. I don't want to befuddle the issue beyond what I've already done except to say that I think the model has possibilities to generalize on an even broader basis than curriculum change.

The question always comes up, "So what, now. We have all these fancy little do-dads with models that you like to build, what good is it going to do us, how does it relate to our problems?" It seems to me that as I have reflected on this I see that man's perception of himself and of externality has gone through several cycles. I think perhaps initially the nature of his reflection upon himself and externality was one shrouded in mysticism and in black magic. I think he has moved from that to reflecting upon himself and upon externality in the fashion of the artist. The stage that we are in today is where man reflects upon himself and his activities in the world around him, in a scientific vein. It behooves us in education, it seems to me, to follow a similar pattern of development. It is no longer satisfactory for us in education to throw up our hands and say, "After all, education is really an art, either you've got it or you haven't got it." We cannot afford the luxury of that kind of escapist rationalization any longer. If we have a sincere commitment to education for all, to the extent that each is capable, then we must put aside those primitive notions about what education is and move in the direction of education as a science. If we are to move in the direction of education as a science, we must have sharp analytical tools. The tools that I have tried to present today may not be exactly the tools that we need, but it is tools of this kind that will help us bring education out of the realm of mysticism, out of the realm of the art, and into the day of science.

## A CONCEPTUAL MODEL FOR A SPECIFIC HEALTH FIELD

Robert M. Tomlinson[1]

The use of conceptual models is in part a reaction to many of the situations we have all faced and been forced into where we must make decisions with inadequate information. We do it day after day and find ourselves "patching up the patches" to where the patches no longer fit. Some way has got to be found to get a "hold" on the overall picture as new problems are generating faster than we can keep up with the individual pieces. The nuts and bolts have to be dealt with, but our decisions can be only as precise and as acceptable in quality as they fit within some structure.

Jake Stern has discussed conceptual models with you in general terms and has shown you some examples of how they might be used. I will attempt to make a transition to application by presenting an example of how one type of model has been used. Intellectual and verbal gymnastics are enjoyable only as long as we all understand the ground rules, but we have a more specific purpose in considering models. That is to

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develop tools which will be of assistance to us in planning and conducting educational programs.

You have been given a copy of a paper, "Conceptual Models for Considering the Utilization and Education of Medical Laboratory Personnel" -- it will be published in the February, 1970 issue of the American Journal of Medical Technology. My discussion today will be primarily from that paper. I plead naivete, ignorance and all those kinds of things in the medical laboratory field itself. The model itself is of a generic nature that I have used in discussions with several occupational or vocational fields. This specific application is presented as an example.

It is not an accident that the title says "utilization and education." I think we must distinguish between vocational and general education when we are talking about, or attempting to consider, disciplines, subjects or educational preparation. Now, when I use the term "vocational education" I'm talking about that organized sequence of experiences through which a person gains entry to earn his livelihood. This is vocational education. It says nothing about the level of that occupation. Jake and I are on the staff of the largest vocational school in the State of Illinois; it happens to be known as the University of Illinois, but it is a vocational school. I assume there are a few strictly generalists there someplace, but I don't care if they are studying the dead Nordic languages the purpose of it is to become employed as a professor or something. They are in preparation for earning a livelihood; that is vocational education.

We have accepted the principle of spending money, public resources if you will, for the preparation of people to earn a livelihood and a higher income at the so-called professional levels for a great many years. If that is a principle that is sound, then let us apply it all the way across the board. As far as I'm concerned, it's just as legitimate an expenditure to use public monies to help the plumber, the auto mechanic or the "pot wholloper" in the kitchen to learn his occupation as it is an M.D.; and you can do it a damn sight cheaper. So, if we have anything close to equality, then for some strange reason I feel that the pot wholloper is just as entitled to his $400 worth of public resources as the $40,000 spent for some other people.

One of the things that makes evaluation somewhat easier in vocational education is that we evaluate programs having to do with preparation for occupations on the basis of the product that they produce. General education is evaluated primarily on the process, what is included in the program not on what the product can do. This is one of the reasons that this title says "utilization and education." When we are talking about the vocational area, I think we have an obligation to look at future utilization as a major determinant of the preparation. Now, that doesn't mean we prepare for only those functions

performed today, nor that the total preparation is limited to immediate application. I'll accept the legitimacy and the desirability of a more broad, general background. I also accept the principle that specialization in vocational education must be built on a base of general education. It is a continuous process, and I don't think you can separate general and vocational education.

I have found this model to be a fairly effective tool in working with a wide range of occupational groups. I like to refer to it very often as my PD to P model; that is, I've found it quite useful in working with groups from painters and decorators to pathologists. This particular paper was an outgrowth of work by the participants in the Teacher Education Institute for Medical Technologists at the University of Alabama. This is what they taught me, and I attempted to put it into writing. It is a model; it is a way of looking at the elements, variables, and components bearing on a particular field. I would ask that you read, or skip over, the first part of it as you see fit when you have the time.

One point I would like to particularly stress is the distinction between quality and level. I think it is important. There is some kind of mystical assumption made that because something is at the college or doctoral level, or because it's called professional it has quality. I want to suggest that there is absolutely no inherent relationship between quality and level. We have professional programs which are just as lousy as we have at any other level. I think we need to make it clear that there is no excuse for low quality at any level.

A second point I would stress is that performance must determine preparation. The objective must be established, the achievements specified. What is this person going to do, to what level, under what circumstances? These must be identified prior to the time you develop a program. Without knowing <u>where</u> you are going, it is impossible to do a decent job of going anyplace. Objectives must come first. Simply because interns have made rounds with the residents, the staff or the visiting specialists is no guarantee that each knows what he is to teach or learn. In fact, there is a study planned now by the M.D.'s to determine for themselves just what it is "rounds" are supposed to do. They have been in a position of not having to answer to anyone so they have not done this type of an analysis in the past. There is no excuse for this type of educational expenditure. You either have a purpose and you know what it is or you don't.

We cannot justify the waste of our limited social and individual resources if we don't have a strong possibility of achieving well defined goals. The day is coming, and I don't think it is too far off, when each of us is going to be required to show that the investment of the limited public and private resources in our courses or programs are

the most valuable use that could possibly be made of those resources, in competition with all other possibilities. There is nothing inherently "sacred" about anything we are doing in any educational program. You will be asked to show that for this period of time, for this amount of salary, and for this investment in facilities, you can produce more output, more gain, than anything else the same funds could possibly be used for. Would you continue to do what you are doing today if you, in fact, had to face and answer these types of questions? They are legitimate questions. I think we are coming to this approach. Before you start, tell me what it is you are trying to accomplish; tell me what investments are going to be necessary to be able to achieve your goals. Then, let's take a good hard look to see if that accomplishment is necessary and if it is worth the investment in comparison to all other investments we might make. It's a little threatening and frightening when you think of it.

The third point, or assumption, is one of integrity, dependability, and initiative. I think we have to make the assumption that these kinds of characteristics must be present in all workers. Not just for the professional, but also for the semi-professional and in the so-called lowest level, or however you describe positions. We must be able to depend on these characteristics in <u>all</u> workers. There is nothing inherently unique to say they exist at the professional levels and not at the lower levels; they must exist at all levels. If we do not have them, it is impossible for the structure to operate.

Each person in the occupational ladder has the responsibility for all those operating under his direction. They cannot beg-off this obligation they must accept it. Therefore, if they make an assignment or permit an activity to occur then they've got to accept responsibility for those who carry it out; knowing that each one lower in the structure has lesser authority and by descriptional relationship has less ability to make appropriate judgments. Each has his own responsibility, but it's within the structure. At any level of decision making, the decision is only as good as the person making it. Any time you sidetrack information and that information doesn't get to the point where the decision must be made, you have reduced the quality of that decision. Decisions requiring judgments must be made at every level. The laboratory technician, the homemaker, whatever, they are making judgments. As I see it, there are no fully proscribed positions where a person performs only automatic procedures or actions. All workers make judgments, even though those judgments may be relatively limited.

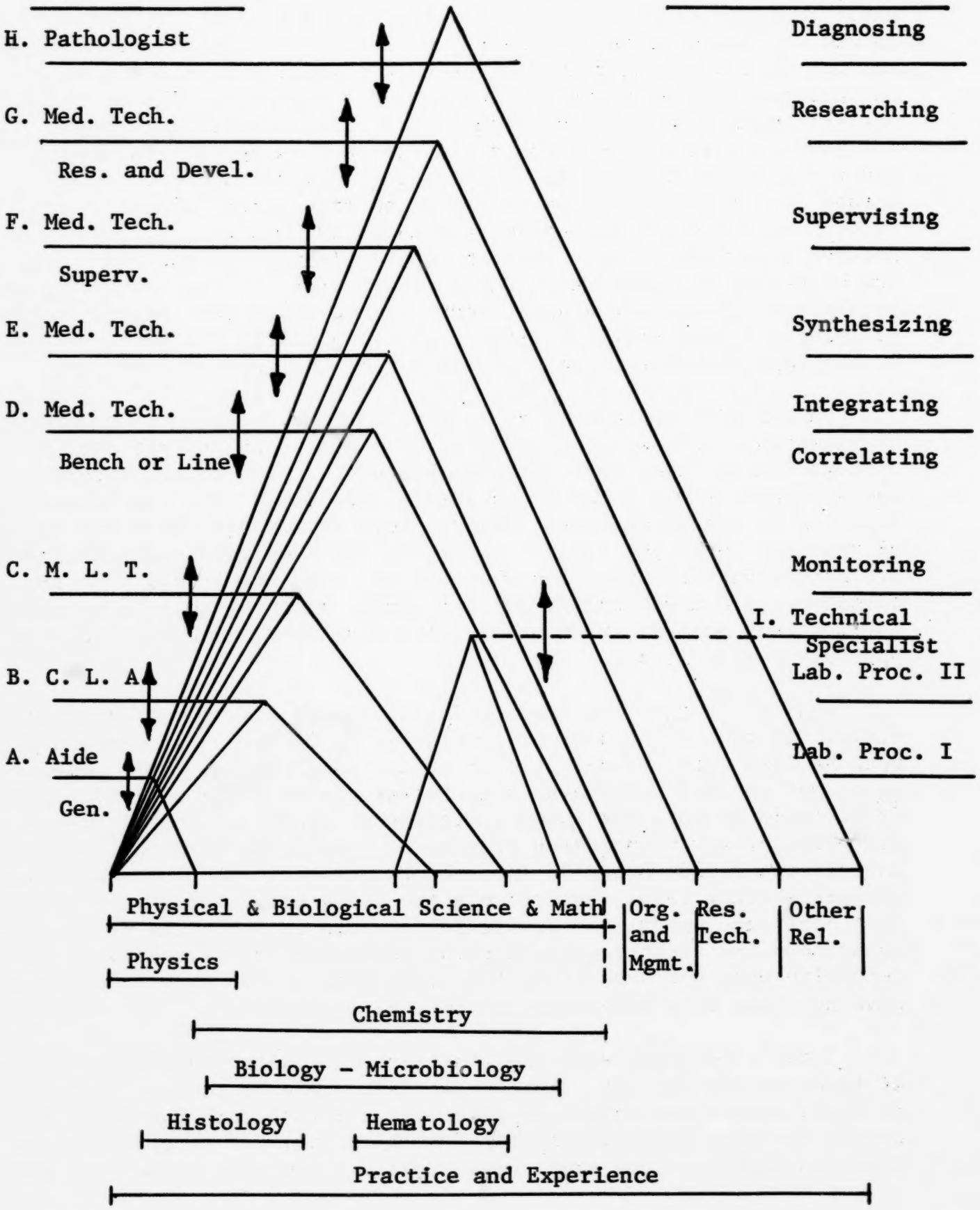
Now, to turn directly to the model. I am going to draw primarily from the cognitive domain taxonomy. What I'm really doing is to use the hierarchical concept, from a low level complexity to a high level complexity. As you will see I am using Bloom's Taxonomy range of knowledge to evaluation. Every field has bits and pieces of facts, and one must know these facts before he gets to the comprehension stage.

He must understand, interpret and use them. The application stage then begins as a kind of dependent relationship -- without the facts and the ability to comprehend these facts, they cannot be applied. You must be able to apply before you can analyze -- break the field into component parts, organize into its logical aspects; determine those things that hang together. What is the central theme across all parts? And, finally, the sixth level is evaluation. That is, making judgments. It is the highest level of intellectual activity. I might say this pattern has been accepted at the University of Illinois Medical School and each student now gets six ratings, one at each level. They have found that honor students may rank high on levels one, two and three, but this did not insure high competency at level six. Some of their own students bombed-out on tests designed to measure achievement at level six even though they had scored high on tests by each separate department. It shook them up. They began to ask themselves, what kinds of things are we teaching, and what kinds of things are we not teaching that graduates are expected to practice or utilize?

Let's now look at the model shown on the following page. What I'm attempting to convey here is that the medical laboratory field is based on disciplines from which subject matter is drawn to provide professional or occupational competencies. The curriculum draws its content from physics, chemistry, biology, mathematics and so forth; histology, hematology etc., are involved as subject matter or specialties. All levels of personnel, the technicians, aides, whoever they are, have elements of these subject areas involved in their activities. It may be something about safe practice, about sanitation and may be at a pretty simple level, but it is drawn from common areas. In addition we have a whole area of practice and experience. All that is required on-the-job is not in the verbal or intellectual sense. Certain things must be learned in the psychomotor area as a result of practice and experience.

I assume that there are "sixth level" evaluations made even by the lowest level aide, because they do in fact make judgments. They draw from the total base, not just from physical science but across the entire base. There is a component or modular unit drawn from each appropriate area. If we go to the clinical laboratory assistant, they have more, or additional, bases from which they must draw. They also have to know <u>more</u> about chemistry, <u>more</u> about biology etc., than the laboratory aide. The judgments they are making are at a higher level because they have a wider and deeper base for doing so. If we knew what performance was required at each level--including actions and judgments--then we would know something about how to raise each person from one level to another by adding certain additional learning experiences. I don't know whether the MLT is accepted in your structure of this field or not, but the medical laboratory technician could be advanced to a technologist, again by providing pre-determined additional learning experiences in an integrated process. They would draw from not only a broader base of fields but would go into them to a greater depth,

RELATIVE LEVELS OF PERFORMANCE AND BASE OF PREPARATION FOR MEDICAL LABORATORY PERSONNEL



both in practice and in content. You will notice at each of the levels there are overlapping arrows. This shows clearly that functioning at the various levels is not clear cut.

The people of the Institute last year felt that there were really about four levels of operation within those designated as medical laboratory technologists. The bench technician is that person who is working in a particular unit or section primarily as a production technologist. They exercise judgment at a higher level than technicians, but it's more or less repetitious, or within a restricted range. They may perform similar tasks for six months or six years. The "full" medical technologist is one who is doing a wider range of activities across the field. The supervisory technician is one who has some additional responsibilities--organization and management, and other related activities. The research and development technologist adds a new component of learning in the research area. It may take preparation in a selected area and a great deal more depth in that area. You will notice there is a vertical arrow for the pathologist also because there is overlapping between the pathologist and the technologist.

In addition to the hierarchical structure, there are some technical specialists, such as blood banking. These persons may not have a broad preparation but they have considerable depth. How do you intermingle the specialties which require a specialized depth with the breadth required of the generalists? Every field represented here has this kind of problem. With the rapid increase in our knowledge and techniques, we are forced into the position where no one can know it all. We are forced to have a generalist who can handle anything that comes through. Yet more and more information is being developed, no one person can possibly handle it all.

What I'm suggesting is a potential way of looking at an occupational field. It may or may not be accurate or applicable. It certainly is not the last word, by any stretch of the imagination. But, someway we've got to find some keys, some themes, to help tie a field together. If we could accept, for example, that the primary or the ultimate criterion of any preparation program is quality performance, then we can analyze the field, break it into the requirements of performance and measure whether these requirements are being met. And, I don't mean just paper and pencil tests. It is possible to determine such measurements, but the <u>first requirement</u> for measuring or evaluating is to determine what the heck it is they must know and be able to do; and we have not made this determination in most areas.

I can't tell you what the functions are in the laboratory field; it takes people who are competent in that field to do it. Once they do that, then I can help them determine the structure for doing it. That's the area where we can be of help to you, but we can not tell you what you ought to know about your field. I can also raise some pretty

nasty questions when you start fooling around with it. Are you sure, and can you give any evidence? As an example, I'm a little suspicious that a high percentage of the total anatomy and physiology taught in nursing programs is only there because it's in the physicians program. And then, of course, since registered nurses teach practical nurses, on it goes. I suspect it also applies to some other fields.

When we can get occupational levels determined on a performance standard basis, and it is measurable, then, moving from one level to another level up the line becomes a relatively simple process. We would know what performances are necessary and instead of your telling me you need 1600 clock hours in something, we would evaluate the student. Let him demonstrate what he can do. Possibly he can perform in this area, this area and that area satisfactorily, but not here, here and here. We now know which learning modules of instruction he must complete and demonstrate. He proceeds at his own pace and I don't care if it takes two weeks or six months. Oh, but you say, it has to be working with the patient to get these understandings. All right, if that is a legitimate requirement for the performance, I'll accept it. If some affective behavior is a part of the required performance, say so. Tell me under what kind of circumstances the performance must be carried out, and then we will design the evaluation for evidences to show that they have it or that they do not have it. If they don't we will prescribe experiences so that they can develop the behavior. Can you do it, or can you not do it? This is the legitimate measure, not the number of clock hours. Once we reach this point, the idea of a career ladder becomes relatively attainable.

This also tells us something about conflicts and distinctions between and within fields. As in the case with inhalation therapists, should they have two weeks or four years? With the above, we would have some way of approaching an answer. This, then, is one way of looking at a field including each specialty and those that are related. I would propose for a moment that this is a construct that might work across other areas, or fields. There are other areas which might overlap and a more complex model or series of models could be developed.

Some have suggested that we should develop this model like the one shown but in the inverted position. When we start planning programs, this is exactly what I suggest we do. You tell me what sixth level judgments the person will be called upon to perform. After we determine these, then we can work backward to the next steps. What syntheses must they be able to handle? What analyses must they be able to make? What applications are they going to have to be able to carry out, and so on down to the specific facts. For examing an occupational field, I have found this model very helpful in grasping the relationships and providing some order to an otherwise overwhelming task.

# WRITING EDUCATIONAL OBJECTIVES AT VARIOUS LEVELS OF SPECIFICITY

Jacob Stern[1]

I would like to discuss educational objectives in the real context in which we find ourselves today. That is, as participants of this institute dealing with health occupations education.

In this institute, just as in any other activity we might be engaged in, or any occupation, there is a reward system and there are risk factors involved. In the early stages of many activities, it is very difficult for us to get a precise fix on what the rewards are, or can be, and what the risks are. The rewards and risks in a situation like this emerge gradually as the activity progresses. The staff has objectives for the institute, they are written, you can see what they are. To internalize them, to make them meaningful to each of us individually as individual human beings, is a process that we have to go through. That's what many of us are going through in the course of the institute right now. We are trying to see how these different kinds of things that are occurring have some reward value for us in our total system, or individual system, and what risks are entailed as we process these things and try to utilize them. I think we've reached the stage in the evolution of this institute where we are beginning to lose the innocence we bring with us when we come to an institute like this. We are beginning to see that there are some risks involved and some of us are saying, "The risks are too great for the potential rewards." Others are saying, "The rewards are great enough to justify the risks." This is the kind of cycle that seems to be going on now among us in this institute, and I think it is basically a healthy thing. There is no instantaneous revelation that can take place in an activity like this, where you can immediately get a clear fix on the reward system, and the risk patterns, and find a place for yourself that is comfortable and forge ahead with progress. It can't be done. So, all I can do is hope that you will have the forebearance to work this thing through to the point where you begin to feel comfortable, and to the point where the rewards and the risks begin to clear up and you see what some of the outcomes may be for you.

Now we've talked about models for analyzing occupations. There is a value that perhaps wasn't made sufficently clear yesterday for looking at occupations in terms of abstract concepts as they are. That value has to be clarified today. I believe we generally accept the concept that the health occupations field is a highly volatile field. Most of us see it as a rapidly changing, dynamic field. New occupations are

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emerging, others are splintering off, functions are breaking off one occupation and being clustered in another place. Whenever an occupational field is in that kind of turmoil, then the use of some type of tool, device, or analytical system is absolutely essential. We have to look at the new clusterings and say what they are, if we are to organize instructional programs for them. Obviously, if the occupational world were a static entity, we would not need analytical tools to conceptualize a particular occupational field. But these fields are not standing still, they are vibrating on us, they are changing right before our very eyes. The faster the changes, the sharper our analytical tools have to be. This is the reason for the kinds of models that we were working with yesterday.

Now today, I want to spend the bulk of our time on tearing down and building up. We are going to be looking at educational objectives. The tearing down part has to do with artificial dichotomies. It has to do with the unwarranted emphasis on behaviorism. The putting together I want to do is to show that structured activity can be systematically traced step by step by step in a logical analytical fashion back to some kind of social values such that the whole pattern makes some sense and can be justified. That's what my purpose is today. I think I can do this in any number of ways. I will start with an example, a naive example, and then we'll develop what I call a hierarchy of educational objectives from the general to the specific in an area where we have mutual concerns.

Let's take the naive example first. When I asked my son to drive me to Tommy's house on Friday at about 12:30 in the afternoon, I had an objective in mind, an intent, a desired outcome. It was to drive to Iowa City. I was going to use his car because it was loaded down with the video tape recording equipment that we've got in the other room. My objective, my intended outcome, was to drive from Urbana, Illinois to Iowa City, Iowa. Now, you might call it a goal; I don't want to wrestle with these words. I call them all objectives. How in the world am I going to get there. Well, now, that's another question. I am going to get there by going to Bloomington, Illinois, turn north on Highway 51 and go to Interstate 80. From there I'll turn west and that's how I am going to get to Iowa City. I find that I have three steps; I have lower level objectives. The higher level objective is to get to Iowa City. Getting to Bloomington, Illinois is merely instrumental in completing the trip to Iowa City. Getting from Bloomington, Illinois to the intersection of U.S. 51 and Interstate 80 is another instrumental objective. And, then getting from the intersection of 51 and 80 to Iowa City, that's another instrumental objective.

That's fine, I've got a fix on that. Now, how do I get from Urbana to Bloomington? Well, I get out on Interstate 74 and drive until I come to Illinois 150. Do you see what I'm doing now? I start with a general objective--to get to Iowa City, Iowa and then say, "How am I

going to accomplish that?" Well, I've got to get to Bloomington. Then I say, "How am I going to accomplish that?" First I must get to I-74. I could go on and on with this and I'd finally wind up with grabbing the ignition key between the index finger and the thumb.

I've done this by systematically asking how. How? How? How? I move from the general to the specific, by doggedly asking how. Why do I want to get to Iowa City, anyhow? Well, that's a good question; I've been asking myself that same question over and over again. Well, we've got an institute in Iowa City. Getting to Iowa City is instrumental to a higher order objective, which is conducting an institute. This trip is meaningless in itself unless it makes a contribution to this other objective. Now, I have to ask the further question, "Why conduct an institute?" Another difficult question to answer. But there is an answer to this question. The health occupations field is a rapidly growing field and in need of assistance in terms of teacher education. There is a need to enhance the teacher education dimension in the health occupations. That's the reason we want to conduct the institute in Iowa City. Therefore, that's the reason I have to get there. O.K., I'll go one step further and say, "Why do the teacher education capabilities of health occupations personnel have to be enhanced?" Well, there is a social force that has been building up in the United States that has resulted in the health industry being one of the most rapidly growing industries in the country. Maybe this is a function of our affluence; if it is, it's a good place to put our money, as far as I'm concerned. Look at what I have done now. Call it mental gymnastics, if you want, it doesn't make much difference what you call it, but I've developed a hierarchy of purposes. I call it a hierarchy of objectives from the general to the specific. At the most general level, I'm making a contribution to some social force to be desired. That is, to enhance the health and well-being of the American people, or of the human race if you want to go beyond that, for some of you will influence the health occupations field beyond the boards of this country. So, it's to enhance the health and well-being of the species. Now that's a far cry from driving from Urbana, Illinois to Iowa City, and yet that link is an important event that is indispensable in the clarification of educational purposes. It is that chain, link by link, that we have to be sure we have established.

Now this thing works, but it's hard work. People who don't want to work hard will not achieve the kind of clarity that I think is needed in order to move programs forward. I don't know how much of this is going to be done during the course of the next two weeks, but I would hope that each of us would have an opportunity to experiment with it, to try it out. Students in my university classes have worked on it and some illustrations of their work are on the walls outside this room. We usually wind up with about 7 or 8 different levels from the general to the specific.

I want to come back to Mager, and writing objectives in specific behavioral terms. Bob Stake of our staff at Illinois asked me recently, "Guess who's writing an anti-Mager book?" I said, "Who?" He said, "Mager." I said, "Thank God!" You know, like a lot of other things when we become attached to a new fad we just lose all sense of balance. We go completely berserk over whatever the fashion happens to be at that particular time. The trend toward behaviorism in stating educational objectives has had a very good effect insofar as it has forced us to really examine in behavioral terms, in observable terms, the kinds of performances that we expect of our students. The big problem with behaviorism is that there has not been any linkage with social purpose. There has not been a linkage with some greater entity. There has been no way to say, "Whence cometh these specifics?" Where did they come from? One has the feeling when one talks with people like Mager, or some of the others who have been enamoured with this concept, that there is an instant revelation; you know we call it the "electric light bulb syndrome." All of a sudden the light goes on and we see these behavioral objectives before us. Whenever you get an opportunity to ask them whence cometh these behavioral objectives, the answer is, "Well really that's not our problem." Educational objectives for any program can be systematized along the lines of what I've just described by asking why and how. These are the questions that will plague man to all eternity.

One question that interests me very much is how far to specificity do we go? Obviously we can go right down there to grasp the ignition key between the index finger and the thumb of the right hand. Now, that may be a trifle too specific. How do we determine when we have gone beyond the pale, when we have reached too far down toward specificity? Yesterday I talked with you about what I call confidence factor. Confidence factor helps me determine where that instructional band should be; that band below which it is risky to get too specific and above which it becomes too meaningless or so general that the instruction doesn't help very much. When you look at some of the models out on the wall, you'll see some of them have different colored bands through them. Some of my students call them instructional levels, confidence factors, or what have you. Judgments have been made about what is about the right level of specificity at which instruction should be pitched. Some of the work that has been done shows jagged lines. There is ample justification for that. Sometimes, based on critical elements within the occupation, there are cases where you must dip down to levels of specificity that you wouldn't otherwise go down to. It's a critical element. Maybe a case of life or death in regard to a patient or something like that where you must go down to a very low specificity level. In other situation instruction will be at a somewhat higher level.

At the onset in developing a hierarchy of objectives no decisions should be made on what needs to be included and what needs to be thrown out. First, let's get it all up there. That's why the charts are so

big. You may not be able to teach all of the things you come up with because of limited resources you have, or possibly you don't have the time for it. There are other things that need to be done before you can make final judgments about what can be selected in and what can be selected out. I spoke yesterday about drawing a matrix of complexity and frequency. After you have a hierarchy of objectives developed then it's possible to look at your complexity-frequency matrix and say, "O.K., these are the kinds of things that should be taught first. These are the kinds of things that should have more emphasis, these are the ones that should have less emphasis." Most of the time people want to start chopping too soon. My recommendation is to get it all down first and resist the temptation to make a decision about what the level should be until the listing is completed.

Remember that all of this goes up to a social value of some kind. I've not been able to chase these things beyond a social value. We usually wind up with proving to ourselves that the trip to Iowa City will contribute to the "good life," whatever the good life may be. And at that point, I usually stop worrying about it.

Let's take a closer look at behavioral objectives. There are three indispensable ingredients to a properly stated behavioral objective. First, there must be conditions under which the behavior will manifest itself. The statement often reads something like, "Given a 1969 Pontiac Executive, the individual will drive to Iowa City." The condition in this case was, given a Pontiac. Maybe if I were given something else, I wouldn't know what to do with it. It would certainly be a different set of conditions and it might involve some different learnings. So, that's the first of the three elements.

The second element is that the statement is behavioral and therefore has an action verb in it. Drive, to drive, the individual will drive. It is not to be mistaken with will appreciate, will know; it is will drive, which is an observable behavior. This is another key element that Mager has identified for properly stated behavioral objectives. A third element that is insisted upon, with less justification in my opinion, is the criterion measure. The criterion measure says how well did he do it. We could have said, "Given a 1969 Pontiac Executive, Jake Stern will drive to Iowa City in five and a half hours." I would have failed the test because I made a wrong turn. A white Ford with Iowa license plates on it passed me so I said to myself, "All I have to do is follow him and I'll get to Iowa City." I followed him, followed him and followed him. He even turned off my route and I followed him. I had my objectives written down. I was supposed to turn onto U.S. 51 when I got to Bloomington, but then the white Ford diverted me. Popham refers to this as "avoiding irrelevancies." That Iowa license plate on the white Ford was an irrelevant element in the whole analytical picture and I should have ignored it, avoided it. Therefore, I arrived about a half hour late and would have failed had the criterion been five and a

half hours. Also, if one looked at the speedometer they would have found that I drove more miles than I should have too. So there is the criterion measure that is an essential element in Mager's construct. Again, the three of them are, the conditions under which the behavior will manifest itself, the observable behavior or action verb, and the criterion measure, or basis upon which satisfactory performance may be judged.

The criterion measure may be in time, it may be the number right versus the number of wrong, or it may be on the basis of certain specifications. For example say I'm to place a washing machine in a level position. The criterion measure for that behavior might be level within plus or minus five degrees. That's a criterion measure, but it may not be satisfactory because I am not an appliance repairman, so I don't know. Maybe it should be plus or minus one degree, or half a degree. Anyway, when you instruct an appliance installer and say, "Set that thing so that it's level," he may come right back with, "How level is level?" What's the criterion measure? I had a similar problem with some nurses in my class one time. The objective was to give the patient a bed bath. The student will be able to give the patient a bed bath. We went through this "how" bit--how, how, how. We get down to the bottom how, and they said, "the student will prepare the bath to the proper temperature." So I said, "That's fine, that's indispensable because if you are going to give me a bath I want to make sure you don't scald me or freeze me. The temperature has got to be right." But then I said, "How about a criterion measurement for that objective?" One gal then said to me, "You know it's just right, it's just right." I told her, "That will not do; it just will not do. Just right, doesn't communicate to me. What I want to know is should it be 107 degrees or 98 degrees, plus or minus a degree and a half. I think some decision should be made." So, somebody raised their hand and said, "I know what the proper criterion measure is for that objective, Dr. Stern. The water is just right when the patient purrs."

I indicated to you that I am concerned about the unwarranted emphasis on the criterion measure. I'm not saying that the criterion measure is inappropriate at all times, so please don't misunderstand me. I'm saying that often times we shoehorn criterion measures into objectives when we ought not to do so because the confidence level is not such as to justify criterion measures. At the more general levels of educational objectives it becomes more and more difficult to write appropriate criterion measures. At the specific end of the hierarchy criterion measures do make sense and can be of valuable assistance in determining the degree to which your objectives have been met. As you move up toward assumed values it becomes more and more difficult to assess the value directly, except insofar as each of the lower level objectives supports the previous one. So, if I succeeded in getting as far as Bloomington, to that extent I succeeded in accomplishing my objective of getting to Iowa City. The lower level educational

objectives provide the proof or criterion for measuring accomplishment of the higher level objectives. It's a cumulative process. Let's say we want to enhance a student's potential employment. What kind of a criterion measure can you write for that? Well, to the extent that he has certain skills, then the probability of success at the next higher level of generality is much more likely.

Next I'd like to spend some time with you developing a hierarchy of objectives. I will start with one that reads: The participant will be able to plan, organize and conduct a teacher education activity for health occupations education personnel. Where did I come up with an objective like that? I seem to have started in the middle of the hierarchy somewhere, but it really doesn't make any difference. You can go toward the general or toward the specific by just following the analytical process that I went through with my trip to Iowa City. I can ask, "Why should the participant be able to plan, organize and conduct teacher education activities for health occupations education?" If we cannot provide a really convincing answer for that question then it is not worth doing. People who work with me on these hierarchies, or objectives, get a little upset because I keep pushing them in the direction of generality. They keep saying, "Why are you bothering me with these higher level generalizations?" I think this is important for unless you can justify what it is you want to do, how in the world can you convince anybody else of the worthwhileness of that activity? Furthermore, how are you going to get money to support it? How are you going to get students to come into your program? How are you going to get people to come to teach? So, it is necessary for us to justify our programs by asking why. We must move step by step, toward generality as well as to move instrumentally toward specificity. With this particular objective I'm not going to bother going toward generality for we've justified this need in our other discussions. What I would like to do is move toward specificity. We ask the question how. How are we going to plan, organize and conduct? What are the parts that fit together to make this particular objective? We go there via two routes. One, by modifying the verb and one by modifying the object. You have to go both routes, too. In this case modifying the verb is easy because it's already done for you in the statement. It says plan, organize and conduct. Those are different kinds of behaviors. So, one supporting objective would be the participant will be able to plan, another one will say the participant will be able to organize and another will be the participant will be able to conduct. So we've sorted out now and from one we have three. The important notion is that there is a systematic ladder developing here and not a set of objectives with way up yonder, some distant goal. The process becomes a step by step linking between that and this.

As we move toward specificity we must have greater precision. We say what kinds of teacher education activities? Well, conferences would be one, institutes another, and short-term credit courses. We divided

the verb up into three; we divided the planning up into three, and the behaviors into three. We have plan conferences, plan institutes, and plan short-term credit courses. We can do the same with organize and with conduct. So, we are spread out to where we now have nine objectives extend from the original one. Now let's take one of these, say to plan; the participant will be able to plan a teacher education institute for health occupations education personnel. We're not talking about activities in generic terms, we are not talking about conferences and short-term credit courses, we're talking about an institute. How do we accomplish that? How does one go about planning a teacher education institute? One thing we must do is ascertain the need. We will start with, "the participant will be able to . . . " We could say clarify the need, determine the need, ascertain the need, or identify the target population. The behavior is a little sharper with identify. What other objectives would be instrumental to the planning for a teacher education institute beside identifying the target population? How about, develop criteria for the location of a teacher training institute? Similarly, I am sure you would have to develop criteria for the selection of participants. That one would come under the target population objective.

Under the above objectives we would develop objectives which were more specific. To the degree that the objectives are written with some sharpness, some precision, the nature of the evaluation is almost predetermined. For example, we have certain objectives for the institute in which you are now a participant. The evaluation, if we are to have the integrity we should, must be drawn from those objectives. They must emerge from these objectives, and be faithful to them. So, the two go hand and glove -- the objectives and the evaluation; although the precise mechanism for the evaluation may not be clearly delineated in the writing of the objectives.

We've gone to about three levels so far; let's now take the objective on developing criteria for selecting participants and detail from it. It supports the objective, establish the target population, which itself is a part of planning for a teacher education institute, a part of the objective we started with. So let's get to the question of establishing criterion for selection of participants. How will we select our participants? Are we going to provide some stratification in our sample of participants? O.K., the participant will be able to select a program stratification system for the selection of participants to the teacher education institute. Now, the stratification system will embrace certain kinds of things; there may be geological, occupational and age factors.

(Comment from participant: "I'm concerned about the fact that we are hung up on selection criterion for participants when in fact we have not as yet decided what's to be done. I think until we do that, selection of participants is immaterial.)

Your point is well taken. In the general sense, we can discuss selection, but in the specific sense you're right we cannot because we haven't established the other objectives. Developing objectives for this hierarchical structure has to be done across the board. The whole group of objectives have to be detailed pretty much at the same time. We work one part a little bit and then come over and work the other some. If we try to work one segment all the way, we are not going to get the job done. We must build the whole structure.

(Question from participant: "With limited personnel and time, how can one possibly get all of this done? What must be sacrificed?")

Yes, you may have to short cut it. It's a risk factor. It depends upon how big a risk you are willing to take. That's the basis of this whole thing. The better you plan, the greater your probability of failure. So, to the degree that you are willing to risk failure, you can reduce your planning. Ideally in curriculum work of this type you develop each of these categories or branches all the way down to the bottom before a course or program is initiated. Practically this is not always done, but we should strive to do so.

There is something else that I wanted to emphasize, and that is this business of levels. I'm very much concerned about this because there are a number of related concepts that I want to get across that require meticulous concern for the maintenance of appropriate levels. In other words, we don't want to mix up a bushel of fruit with a pear. When we are comparing educational objectives, we must compare them across the same level of generality. That is very important. There is a concept that I call "compatibility of educational objectives." When there are two adjacent educational objectives at the same level in this hierarchy, two adjacent educational objectives, I want to know how they compare with one another. Can they in fact be taught side by side? Do they require different facilities, different teacher competencies? Do they require different instructional resources? The compatibility index is something that makes sense only if you maintain a sharpness between levels of the hierarchy. There is another concept that relates to these levels of generality that we want to watch out for. I call it the "subordinance and dominance" of educational objectives. You often must compare educational objectives as to their relative degree of importance. There are some which you can slump off and some which, at the risk of cutting your throat, you dare not slump off. They may be at the same level of generality, but some are more dominant than the others. Some are more crucial than others. If you must make sacrifices, make sacrifices on those objectives that are more toward the subordinant end of the continuum than those objectives which are more toward the dominant end. What I typically do is take my instructional level, determined by the confidence factor, and I look at the 36 objectives or however many I have and then rank them all on this subordinance-dominance continuum. Say objective 15 is way up on dominance and objective 19 is way down on

subordinance. I now look at my resources and based on the position I've given them on the subordinance-dominance scale I make decisions. Because certain ones are dominant objectives, because they're so vital, I must allocate more resources to them.

Our next action is to go into specialty interest groups, and try to get some handles on this hierarchy of educational objectives concept. Let's see if we can't design some hierarchies for ourselves; to begin to systematize our business of education.

## OBJECTIVES IN MEDICAL EDUCATION(OPHTHALMOLOGY)

Bruce Spivey[1]

I would like to discuss with you what I refer to as a "what to" problem. I was faced with the problem of what should a student learn and what to teach, a problem familiar to many of you. I answered this question in a study this past year, when I took time from my duties here at The University of Iowa and participated in a master's degree program in education at the University of Illinois.

There were eight of us in the program. We were brainwashed and thrown the educational objectives pitch, just as its being stressed to you presently. I had to go through the uncomfortable experience, as many of you are, of writing my own personal objectives and having to defend them and say whether or not I had achieved them. I think it is a worthwhile experience and it is something that I hope to continue to do for the rest of my life.

We are instructed to state our objectives in educational or behavioral terms. This then leads naturally and directly into the development of learning experiences appropriate to the objectives. Following this, and also implicit in the objectives, are evaluative mechanisms. Thus we have a circle, or cycle of objectives, learning experiences, and evaluation (Figure 1). Actually, if used correctly, it is a spiral because the first time through you see what was wrong or lacking in the objectives, learning experiences or evaluation, and hopefully you improve them. You continue by discarding some objectives and adding others each time as appropriate, so I think we have an educational spiral rather then just a circle.

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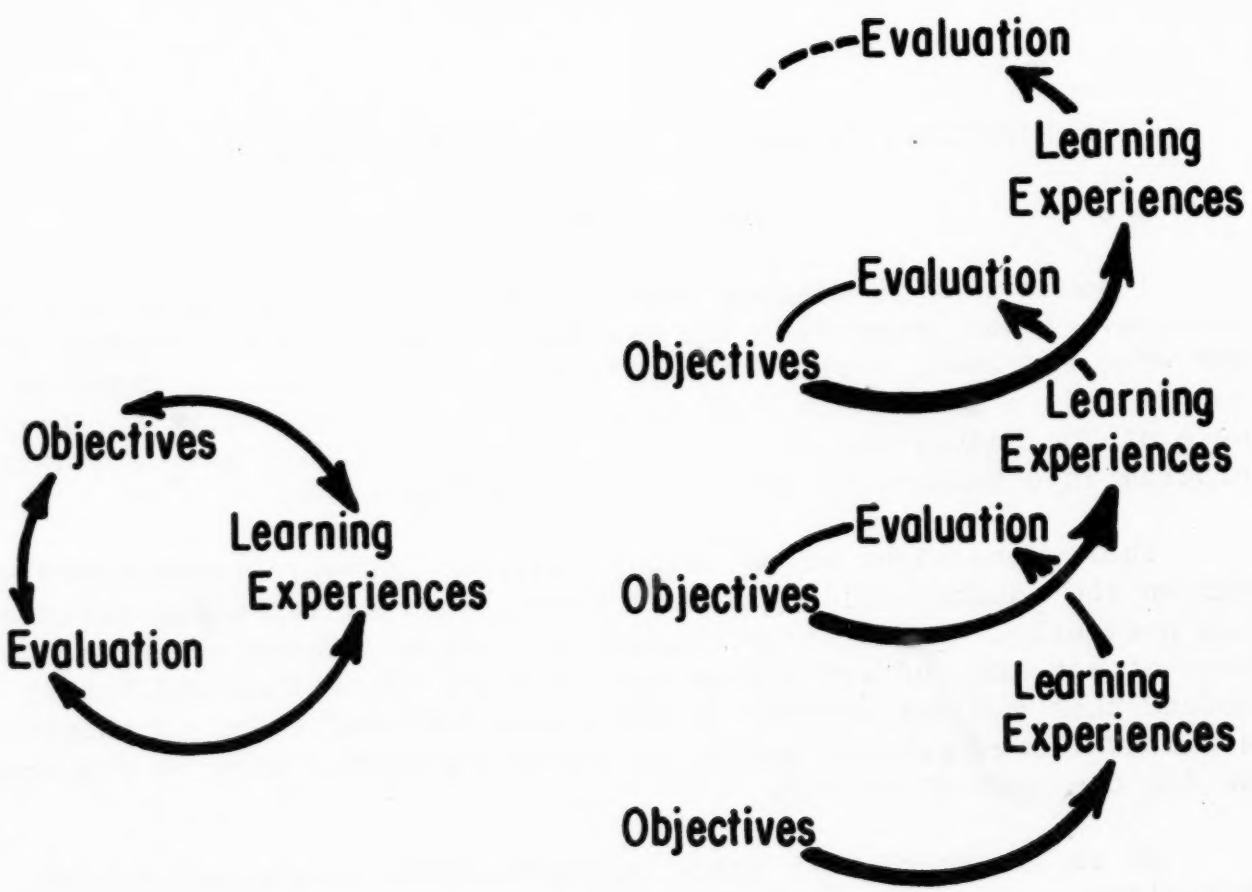
FIGURE 1


Objectives
Learning Experiences
Evaluation
Evaluation
Learning Experiences
Objectives
Evaluation
Learning Experiences
Objectives
Learning Experiences
Objectives

To return to the problem: my problem is what to teach ophthalmology medical students. This is not the greatest of the world's problems, but it is a challenge that must be met. In many varied ways we are all faced with the proliferation of knowledge, attempts to decrease the curriculum time, and the desire that everyone get in their own bit. We must decide what exposure is important and what exposure is not important. Ophthalmology for medical students is not essential. I think that a person can practice medicine without knowing much ophthalmology, but his performance will be limited.

In this study, I attempted to find a minimum acceptable performance in ophthalmology for medical students. Minimum acceptable is not to be equated in any sense with minimal. The standard which is set as the minimum acceptable may in fact be very high. Certainly in the health field, it is necessary for us to set our goals and objectives very high, and to enforce a minimum performance level which is not low.

There were several possibilities that occurred to me for determining what to teach, or better stated, what the students should know. One was to observe how ophthalmology skills are used in the field. This however, is time-consuming, costly, and may be, in my way of thinking, an inappropriate way to get the desired results. If you observe what people are doing you may simply be viewing a poorly developed fund of information, and your results may be very shaky. So, I did not have the time, the money or the inclination for observation.

A second method would be to simply decide what is needed on the basis of my own knowledge of the field, a narrow plan previously tried by many people. Obviously, I could not have gone up and down the street asking everyone's opinion, without some type of format. I would have gotten a multitude of answers that were not similar. The people questioned may be trying to tell me the same thing, but in order to get consistent responses, I feel that it is necessary to present a limited or forced-choice format. That way each respondent has the same starting point.

In order to develop the forced-choice questionnaire for this study, I followed these steps. First of all, I asked our resident staff and the senior staff what it is they think a graduating medical student ought to be able to demonstrate, to know, or to have at his disposal about ophthalmology. Secondly, I went to the experts, that is the directors of ophthalmology residency training programs and the American Board of Ophthalmology. I also studied available programs. I considered my own personal experiences as a medical student, as an eye resident, as a staff man and as a teacher. I approached the problem by examining what already exists.

There are certain sub-specialties in ophthalmology that indicate problem areas. For instance, the sub-specialty of strabismus (crossed

eyes). This condition is prevalent in 3% to 4% of the population. Therefore, it seems reasonable to require knowledge at least in this particular area. I ended up with seven major areas of eye problems. We do not expect ophthalmology medical students to be able to take out a cataract. However, to be complete, we extended each of the areas somewhat beyond the expected range, or what I thought, on the basis of experience, was the expected range. And finally, in developing this questionnaire, I asked myself is it possible? I did not want to put in something that was patently inappropriate and which would make those responding any more petulant or uncooperative than they might already be.

Let us look at one of the seven areas from the questionnaire (as shown on the next page). You will notice that these areas are structured for the most part like Mager objectives. Let me say that my first draft was not constructed this way. Although I thought I could organize it very rapidly, it took me three months to develop the questionnaire. Initially there were about 20 items under each of the seven areas. I wrote out the objectives in paragraph form originally, then I revised them and made each terminal behavior a "stand alone" portion. As an example, look at number six. The first time I wrote it, instead of "to be able to evaluate the color vision", I included "normal or defective, congenital or acquired, inconsequential or functionally disturbing by utilizing pseudoisochromatic plates and the Farnsworth Panel D-15". Well, you can imagine how people reacted to that. I tested this on some of my friends and gave them anti-emetics at the same time. You can rest assured that people who are not accustomed to educational terminology will be immediately repulsed by it. You have to modify the words that you are using and the form in which you place them so that they are universally acceptable. So, I finally ended up with "evaluate the color vision", which is a compromise, but I think a necessary compromise. Besides, the original questionnaire had too many words; the reader would tire of reading and never complete it. After developing the questionnaire in paragraph form, I attempted to isolate the various terminal behaviors, submitted it to a variety of people, and then finally developed the questionnaire that I distributed.

Notice that the rating "essential" is given as the first value. Originally, I had the ratings in reversed order, from non-importance to essential. This forced people to make reverse mental judgments each time. The question we wanted to ask was, "What is absolutely important?" So we put the "essential" response first. It may have prejudiced the answers somewhat, but I do not think so.

For the survey, I sent out 3,400 questionnaires to medical students, interns, residents, medical school faculty, and practicing physicians, primarily in Iowa, and some in Minnesota and Illinois. I attempted to survey everyone that had any experience, prospective or retrospective, on which to base an opinion of what a medical student should be able to

| II. When given a typically cooperative patient (ranging from a child of three years to a normal or illiterate adult, with "normal" or abnormal vision) as a minimum acceptable performance, a graduating medical student should be able to: | essential | desirable but not essential | useful but should not be required | of no importance | I have no basis for judgment | Do not write in this space |
|---|---|---|---|---|---|---|
| 1. Obtain a history of the visual complaint. | 4 | 3 | 2 | 1 | 0 | 6 |
| 2. Measure and record the distance and near visual acuity. | 4 | 3 | 2 | 1 | 0 | 7 |
| 3. Add an additional step, the pinhole, when the visual acuity is not "normal". | 4 | 3 | 2 | 1 | 0 | 8 |
| 4. Make an estimate of the patient's functional status ("normal", impaired vision, or legally blind). | 4 | 3 | 2 | 1 | 0 | 9 |
| 5. Explain to the patient what possibilities exist to improve the vision if it is reduced in one or both eyes. | 4 | 3 | 2 | 1 | 0 | 10 |
| 6. Evaluate the color vision. | 4 | 3 | 2 | 1 | 0 | 11 |
| 7. Identify refractive errors of greater than .50 cylinder and .50 sphere (either minus or plus). | 4 | 3 | 2 | 1 | 0 | 12 |
| 8. Prescribe corrective lenses (for individuals with regular astigmation or spheres from - 6.00 to + 6.00). | 4 | 3 | 2 | 1 | 0 | 13 |

Source: DETERMINATION OF CURRICULUM CONTENT IN OPHTHALMOLOGY FOR MEDICAL STUDENTS

by Bruce E. Spivey, M.D., M.Ed.

demonstrate or know about ophthalmology. Surprisingly, I had about a 47% return. The lowest return, 38%, was from the practitioners. However, I considered that a reasonable return for such a questionnaire.

There are 44 behaviors included in the questionnaire. Various groups responded differently, but overall there was a natural break between the top 17 and the rest of the behaviors. So, 17 out of 44 could be considered as being absolutely essential for inclusion in the curriculum. I am not talking about process or actual curriculum design although if you read these objectives, I expect that the process for both learning experience and for the evaluation is implied. Of these seventeen behaviors four were primarily history taking; two involved establishing a diagnosis; six involved some form of patient examination; three required administering some form of therapy; one was self-evaluation; and another was establishing an etiology.

Analysis of the data shows that general practitioners are absolutely convinced that many more things are important than are specialists. Ophthalmologists responded with the least amount of essentials. It appears that they are saying, "How can anybody else know my field?" "They should send those patients to me?" Using the color vision example again, general practitioners rated this very, very highly or essential. Ophthalmologists and other specialty groups rated it very lowly or non-important. Why is that? Well, general practitioners frequently have to do physical examinations that require the evaluation of color vision, more often than even ophthalmologists, and therefore they need the ability. This is only one of the many interesting sidelights which developed from the study.

I now have a firm basis on which to begin a curriculum. I have data with which I can defend my curricular decisions. I can say to a student or staff, "Okay, you don't think this experience should be included, but 80% of the general practitioners feel that it is important or essential." I can ask a student, "What are you going to be? What do you want to do?" If he replies, "urologist," I will not expect him to know any more than what a urologist thinks he ought to know. I think it is helpful when we can demonstrate to the people involved in the experience the eventual relevancy of what they are doing.

I do not mean to imply that this is the last word in questionnaires. I have found that there are some things that I did not include. Two things which I consider important now, but failed to include were emergency eye care and the soci-economic problems of blindness.

You may ask, "How can you evaluate such a curriculum?" My ideas, very briefly, are: Since we have no routine rotation through ophthalmology, anytime a medical student says that he is ready to demonstrate his ability in eye care, we would present him with three patients. These three patients, who are either simulated or actual, are taken

from within the seven clearly outlined general types of patients. I hope that we will be able to provide a variety of experiences which will allow the students to reach the level of performance prescribed. The question that I have not yet answered is what competency level we will tolerate.

This technique of employing educational objectives in a questionnaire may be employed in any setting. It would seem to be most easily applied where the area in question is relatively well circumscribed and the range of competency to be acquired is not great. The potential applicability, however, will be limited only by the ability and persistence of the educational researcher. As the scope and depth of expected performance increases, the number of potential behaviors increases, as does the problem of evaluation. However, using a sampling technique and a tabulated list of specific terminal behaviors, the evaluation in any area could be more appropriate than often now exists. Some groups have argued that their field is too vast. Vastness implies a problem in binding the questionnaire and the length of time a respondent must spend with it, but in no way invalidates the approach.

It is the author's opinion that the technique has wide applicability within and beyond the medicine. Potential performances when developed in similar manner and submitted to a wide variety of individuals, could allow curriculum content determination in any educational area. Inadequacies of the past teaching and experiences are not limiting factors in developing new approaches for the future.

QUESTION: "What criterion did you use to decide on the experts to review the questionnaire?"

I talked with medical doctors in various specialties. They were content experts, not educational experts. During the development, I contacted many educational experts, but only for assistance in structuring the objectives and the questionnaire format.

QUESTION: "Why did you include students in your survey, and had they completed their ophthalmology experience?"

First of all, I have to admit that I consider the present ophthalmology curriculum and experience disgraceful. That's the nicest way I can say it, disgraceful. So, even the students that had had it, hadn't had it, so to speak. I included them because I thought it important to check the consumer. I think it helps make the results of this study generalizable to any ophthalmology program. Each center must, however, develop their own curriculum based on their experience, their students, the emphasis that their medical school places not only on ophthalmology, but medical training in general. I don't think a

panacea that can be implemented all over the country is the answer. Fortunately, I think the medical schools are becoming more and more dissimilar, more and more unique, not quite so uniform, and there will be variations.

QUESTION: "Did the professors of ophthalmology at other universities respond any differently than other groups?"

Of the 89 chiefs of ophthalmology in the United States, I had responses from 66. They responded in a manner exactly like other ophthalmology specialists. The teachers were no different than the specialists of ophthalmology. The ophthalmologists, as a group, responded with fewer "essential" values and a lot more values toward the "useful" or "of no importance" section of the scale.

QUESTION: "Did you consider including the optometrist in your sample?"

Yes, I considered them and wanted to include them. I didn't for the reason that our communication is lousy. I think that if I had included them without adequate preparation, without laying the groundwork, which I hope to do in this very room soon, I would have been indicted by both the M.D.'s and the optometrists. I am well aware that optometrists provide the "first line" of defense or eye care in an area where there are no ophthalmolgists, but the conventions, the social values, got in my way.

MODULAR UNIT III

## The Learner and Learning

Guidelines:

Educational Objectives

Instructional Strategies

Annotated Bibliography

Supplementary Materials

The Learner and Learning

Appendix A - Explanation of Relationships Within Data, People, Things Hierarchies

The Animal School

Poor Scholar's Soliloquy

The Voice of the Low I.Q.

The Point of View

Supportive Papers:

Social Forces and Their Impact on the Educational Process -- Jacob Stern.

Social Forces and Their Impact on the Student -- Michael Masucci.

The Process of Learning -- Duane Anderson.

An Approach to Student Selection -- Michael Masucci.

Reactions to Concerns Expressed by Participants -- Michael Masucci.

Summary Discussion: The Learner and Learning -- Institute Staff.

## EDUCATIONAL OBJECTIVES

3. Following completion of this modular unit, the participant will demonstrate an awareness of the nature of the learner and the process by which he learns.

   3.1 The participant will examine selected factors and concepts affecting learning.

      3.1.1 Describes characteristics and implications of selected learning theories.

      3.1.2 Cites examples of how social forces affect the learner and the educational process.

      3.1.3 Recognizes the need to consider individual differences among students.

   3.2 The participant will examine student selection processes.

      3.2.1 Develops criteria and student selection procedures for selected health occupations education programs.

      3.2.2 Recognizes the relationships among selection criteria, the educational process, and its product.

      3.2.3 Uses effective interviewing techniques.

## INSTRUCTIONAL STRATEGIES

A pattern of general presentations, participant interaction with presentors and group discussions would appear to maximize the learning outcomes for this unit.

The use of an input-output model is deemed appropriate as the focal point for this module. In such a systems type diagram a box represents the educational process, an arrow pointing into the box the students entering the program, and an arrow leaving the box the educational product in terms of the behaviors achieved. The various topics can be discussed in relation to this diagram, and it can be shown how changing one aspect affects the others. General presentations are suggested on such topics as: The Process of Learning, Social Forces Affecting Learning, Individual Differences, Selecting Students and Interviewing Prospective Students. Along with presentor-participant discussions and small group discussions, a variety of other techniques such as modeling, role playing, and simulating would be appropriate to topics such as interviewing.

Products which might be generated as a result of this unit could include plans for restructuring educational programs to meet specific occupational or social needs, plans for selecting students for specific educational programs, criteria for evaluating student selection procedures, and suggested formats for interviewing students.

## ANNOTATED BIBLIOGRAPHY

Bigge, M.L. Learning theories for teachers. New York: Harper & Row, 1964.

This is a scholarly, yet thoroughly down-to-earth study of the aspects of learning theory that have direct bearing upon schoolroom practice. It is a comparative study: each view is followed into the impact it should (if adopted) have upon teaching. This book, therefore, is a highly practical one, especially so because it embodies the feature essential to genuine practicality -- theory that is followed into its logical implications in terms of practice. The points of view treated are those actively influential today, hence those that need to be understood by teachers so they can be discerning in their classroom procedures, as well as in their reading of educational literature of their participation in professional discussions.

Bruner, J.S. Toward a theory of instruction. New York: W.W. Norton & Company, 1966.

Jerome S. Bruner, according to Harper's Magazine, has "stirred up more excitement than any educator since John Dewey." In this volume, he offers his most recent and challenging ideas on the process of education. His theme is dual: how children learn, and how they can best be helped to learn -- how they can be brought to the fullest realization of their capacities.

Burton, W. H. "Basic principles in a good Teaching-Learning Situation." Phi delta kappan. 1958, 39, 242-248.

Burton lists 22 general principles of learning which would seem to be worthy of consideration by the teacher as he plans for, and is a part of, teaching-learning activities. The principles cover a wide range of concerns all aimed at improved learning.

DeCecco, J. P. The psychology of learning and instruction: educational psychology. Englewood Cliffs, New Jersey: Prentice-Hall, 1968.

Chapter II, Entering Behavior, shows the student of education how to describe assess and provide for the variations in student entering behavior. Empasizes the relationship of entering behavior to instructional objectives and procedures.

Ehrle, R.A. "Personnel classification, selection, prediction and counseling." Personnel administration. 1964, Nov.-Dec., 39-41.

The procedures of classification, selection and prediction as they relate to matching people and jobs are discussed briefly in this paper. Counseling is also discussed and differentiated from the other three activities. Although written for personnel workers, this article may be of some assistance to individuals with responsibilities for student selection.

Hickerson, N. Education for alienation. Englewood Cliffs, New Jersey: Prentice Hall, 1966.

A vivid, well-written description of the ways in which our present school curricula have deprived children of the chance to achieve their full potential. The author discusses "IQ" tests and the ramifications of these and makes recommendations for the education of the economically deprived.

Kuethe, J.L. The teaching-learning process. Glenview, Illinois: Scott, Foresman and Company, 1968.

This book deals with three broad areas: the dynamics of learning, with particular emphasis on the learning process in the classroom; the psychological nature of teaching, stressing interpersonal relationships; and the relationship between teaching and learning.

Mager, R.F. Developing attitude toward learning. Palo Alto, California: Fearon Publishers, 1968.

With a delightful touch of humor, Mager approaches the subject of how teachers can provide a teaching-learning situation which fosters a positive attitude on the part of students toward learning. He offers means whereby teachers can identify favorable attitude and techniques for improving it.

Miller, R.B. Tests and the selection process. Chicago: Science Research Associates, 1966.

Seven central concepts are covered in this brief introduction to personnel selection testing: reliability, validity, measurement, correlation, statistical prediction, criterion analysis, and test development. In addition, secondary concepts and types of tests are discussed. Fifty condensed frames of ideas cover all the central ideas in simple, clear-cut language. Because the book presents only major ideas and concepts -- not technical procedures -- no mathematics or psychometric training is a prerequisite.

McNeil, J.D. "Forces influencing curriculum." Review of Educational Research 1969, 39, 293-318.

Changes are occurring both in theories for constructing curriculum and in what is actually taught in the schools. Knowledge of the powerful forces influencing these changes is limited. An indication of the diverse approaches used to derive such knowledge and the results attained from these efforts will be found in this chapter. Curriculum is becoming more rational because researchers and practitioners are beginning to realize that the desired changes in the learner are the true "ends" and the methods and instructional sequences used to produce those changes are the "means", not to be prized but appraised.

Parker, J.C. & Rubin L.J. Process as content: curriculum design and the application of knowledge. Chicago: Rand, McNally, 1966.

The authors advance the theory that process -- the way a given content is taught -- is crucial to effective learning. Consequently, they argue that any reorganization of the curriculum must concern itself with the methods used to accumulate categorize, analyze, and apply knowledge. Several formal and informal models for incorporating process into curriculum design are described.

Rosenthal, R. and Jacobson, L. Pygmalion in the classroom: Teacher expectation and pupils' intellectual development. New York: Holt, Rinehart and Winston, 1968.

By describing experiments conducted in South San Francisco and other school districts around the country, the authors offer data to support the "Pygmalion" theory that some students may benefit from their teacher's preconceived notions of the students' intellectual ability. They focus on unnecessary failures which result from low expectation. The thesis applies to all children, but is is of special importance for the disadvantaged.

Thoroman, E.C. The vocational counseling of adults and young adults. Boston: Houghton Mifflin, 1968.

Throughout the book the special problems faced by the adult counselee are emphasized: among these are limitations in time and money, family responsibilities and often unrealistic expectations. It is shown that the counselor of adults must have extensive vocational information, unusual skill in test interpretation and the ability to help clients accept their limitations yet fulfill their potentialities. Chapters are devoted to special problems faced by junior college students, women, veterans, the disabled, and older citizens.

Watson, G. What psychology can we trust? New York: Bureau of Publications, Teachers College, Columbia University, 1961.

Included in this publication is a list of 50 psychological propositions on learning which might serve to assist educators in all aspects of the educational process. The sub-topics include: learning process, motivation, teaching methods, subject matter, evaluation, growth and social stratification.

## SUPPLEMENTARY MATERIALS

## The Learner and Learning

Compiled by Robert M. Tomlinson
University of Illinois

1. Learning[1]

   1.1 Change in response or behavior involving some degree of permanence.

      1.11 Caused partly or wholly by experience.

         1.111 Conscious.

         1.112 Unconscious, as is common in motor learning.

   1.2 Includes behavior changes in the emotional sphere but more commonly refers to the acquisition of symbolic knowledge or motor skills.

   1.3 Does not include physiological changes.

   1.4 Learning theorists have attempted to generalize from their abstract and highly controlled experiments in the laboratory to the classroom situation. The conditions differ so greatly that application is quite difficult.

   1.5 There is a dearth of good evidence to draw from in actually determining good classroom learning.

2. Motivation and Interest

   2.1 All learning involves motivation.

   2.2 Motivation provides a state or "set" or predisposition to actively seek satisfaction for his goals.

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[1]Definition from Good's Dictionary of Education.

2.3 Some factors that have a direct relation to motivation in the learning situation are:

2.31 A feeling of personal worthiness.

2.32 Status.

2.321 As an individual in the group.

2.322 Derived from his occupation and institutional association.

2.323 In the eyes of the groups to which he feels membership.

2.33 Level of aspiration of the individual.

2.34 Social and family background.

2.35 Expectations of those he respects.

2.36 Attitudes and interests.

3. Retention and Transfer

3.1 Learning can be evaluated in terms of:

3.11 Speed of response.

3.12 Accuracy of response.

3.13 Practice or time to relearn to a given criteria.

3.14 Interpreting a new situation where previous learning serves as a background.

3.2 Among the conditions that influence retention and transfer, five main classes may be distinguished:

3.21 Those associated with the learning process.

3.211 Human verbal learning is most efficient when practice is divided into relatively small blocks.

3.212 Responses reinforced in any way in any learning situation become associated impartially with all cues present.

3.213 What becomes strengthened during practice is the behavior that actually occurs, not necessarily the behavior that is the goal of the educator.

3.214 The intent of the learner.

3.22 Learning interfering responses either prior to acquisition of the reference response or during the time between acquisition and the tests for retention or transfer.

3.221 New material always enters into presently organized patterns of thought.

3.23 Those pertaining to the relationships between the stimulating situation prevailing at the time of the original learning and at the time of use.

2.231 We form sets or patterns of thinking and classify cues into a context.

2.232 Some actions become almost automatic and changes are not noticed.

3.24 Meaningfulness of the relationships.

3.241 No material is inherently meaningful in itself.

3.242 Some material is entirely arbitrary and must be learned by rote.

3.243 All new material has meaning only in relation to the previous experience of the individual.

3.25 Those reflecting individual differences.

4. Some General Considerations

4.1 Learning is an active, dynamic and complex process involving a change within the individual.

4.2 The learner reacts to all experience as he perceives it.

4.3 He reacts to experience as an organized whole.

4.4 Learning is essentially an attempt to satisfy his needs as he perceives them.

4.5 A learner's behavior can be understood only from his own point of view.

4.6 The product and process of learning must be distinguished.

Learning is a form of growth related to training, practice and a reorganization of past experiences in light of the new.

Products of learning are represented by such terms as "knowledge," "meaning," "skills" and "attitudes." We must rely on indirect measures of behavior to estimate the "if" and "how" of learning.

4.7 Learning is goal-directed activity.

4.8 When an individual learns new patterns of behavior, he changes as a person.

4.9 Learning involves the process of differentiation.

4.10 Learning is integration or synthesis.

4.11 Individuals differ in the rate, amount and kind of learning they may accomplish.

4.12 Learning is specific and not general.

4.13 There is evidence to indicate that a person with high ability in one area tends to be better in other areas.

4.14 The better-ability person tends to learn faster, and retain longer.

4.15 In spite of common opinion, there is no evidence that any teaching method is more effective with high- than low-ability students or vice versa.

4.16 Methods differ in effectiveness, but each is equally effective for all ability levels.

5. General Intelligence Testing

5.1 Intelligence test results show a substantial correlation with school marks.

5.2 Intelligence test results correlate higher with elementary school grades than with high school grades and higher with high school than with college grades.

5.21 A general intelligence measure does not isolate particular abilities appropriate to various kinds of curricula.

5.22 Multi-factor tests which yield several sub-test scores have been more successful in predicting success at the higher or more specialized areas of learning.

5.3 Previous school achievement has been as good as, if not better than, predictors of later success.

5.4 Intelligence test results combined with previous school achievement supplement each other to give a better prediction than either alone.

5.5 Intelligence test results show a higher correlation with other standardized measures of achievement than with school marks.

5.51 Some of this can be attributed to:

5.511 General reading and test taking abilities.

5.512 Common elements in the tests.

5.513 A specific, timed sample test does not involve the personal variables.

5.6 The degree to which intelligence test results are related to academic achievement depends upon the subject being considered.

5.7 Although attempts have been made to develop so-called "culture-free" intelligence tests, past experiences and particularly educational experiences have an influence on intelligence test results.

5.8 In general, persons in particular occupations tend to be selected by both education and intelligence.

5.9 Typically there is a correlation between job success and intelligence test results although it may be quite low.

5.10 The standard error of an intelligence test score must always be accepted.

## 6. Application of Learning Theories to Practical Learning Situations[1]

### 6.1 Theoretical Controversies

6.11 Quarrels of the theorists are internal ones, not very important in relation to immediate practical problems.

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[1]Reference: Hilgard, E.R. Theories of Learning, Appleton-Century-Crofts, 1956.

6.12 There are many practical, important experimental relationships upon which theorists mostly agree.

6.13 Practical people today need not wait for the resolution of these theoretical controversies.

6.2 Statements upon which a majority of learning theorists mostly agree:

6.21 In deciding who should learn what, the capacities of the learner are very important.

6.211 Brighter people can learn things less bright ones cannot learn.

6.212 In general, older children can learn more readily than younger ones.

6.213 The decline of ability with age, in the adult years, depends upon what it is that is being learned.

6.22 A motivated learner acquires what he learns more readily than one who is not motivated.

6.221 General - Desire to learn, need for achievement.

6.222 Specific - Desire for a certain reward or to avoid a threatened punishment.

6.23 Motivation that is too intense (especially pain, fear, anxiety) may be accompanied by distracting emotional states, so that excessive motivation may be less effective than moderate motivation for learning some kinds of tasks, especially those involving difficult discriminations.

6.24 Learning under the control of reward is usually preferable to learning under the control of punishment.

6.25 Learning motivated by success is preferable to learning motivated by failure.

6.26 Learning under intrinsic motivation is preferable to learning under extrinsic motivation.

6.27 Tolerance for failure is best taught through providing a backlog of success that compensates for experienced failure.

6.28 Individuals need practice in setting realistic goals for themselves, goals neither so low as to elicit little effort nor so high as to foreordain to failure.

6.29 Realistic goal-setting leads to more satsifactory improvement than unrealistic goal-setting.

6.30 The personal history of the individual, for example, his reaction to authority, may hamper or enhance his ability to learn from a given teacher.

6.31 Active participation by a learner is preferable to passive reception when learning, for example, from a lecture or a motion picture.

6.32 Meaningful materials and meaningful tasks are learned more readily than nonsense materials and more readily than tasks not understood by the learner.

6.33 There is no substitute for repetitive practice in the over-learning of skills (for instance, the performance of a concert pianist), or in the memorization of unrelated facts that have to be automatized.

6.34 Information about the nature of a good performance, knowledge of his own mistakes, and knowledge of successful results, aid learning.

6.35 Transfer to new tasks will be better if, in learning, the learner can discover relationships for himself, and if he was experienced during learning of applying the principles within a variety of tasks.

6.36 Spaced or distributed recalls are advantageous in fixing material that is to be long retained.

## Appendix A[1]

### Explanation of Relationships Within Data, People, Things Hierarchies

Much of the information in this edition of the Dictionary is based on the premise that requires a worker to function in relation to Data, People, and Things, in varying degrees. These relationships are identified and explained below. They appear in the form of three hierarchies arranged in each instance from the relatively simple to the complex in such a manner that each successive relationship includes those that are simpler and excludes the more complex. The identifications attached to these relationships are referred to as worker functions, and provide standard terminology for use in summarizing exactly what a worker does on the job by means of one or more meaningful verbs.

A job's relationship to Data, People, and Things can be expressed in terms of the highest appropriate function in each hierarchy to which the worker has an occupationally significant relationship, and these functions taken together indicate the total level of complexity at which the worker has an occupationally significant relationship, and these functions taken together indicate the total level of complexity at which he must perform. The last three digits of the occupational code numbers in the Dictionary reflect significant relationships to Data, People, and Things, respectively. These last three digits express a job's relationship to Data, People, and Things by identifying the highest appropriate function in each hierarchy to which the job requires the worker to have a significant relationship, as reflected by the following table:

| DATA (4th digit) | PEOPLE (5th digit) | THINGS (6th digit) |
|---|---|---|
| 0 Synthesizing | 0 Mentoring | 0 Setting-Up |
| 1 Coordinating | 1 Negotiating | 1 Precision Working |
| 2 Analyzing | 2 Instructing | 2 Operating-Controlling |
| 3 Compiling | 3 Supervising | 3 Driving-Operating |
| 4 Computing | 4 Diverting | 4 Manipulating |
| 5 Copying | 5 Persuading | 5 Tending |
| 6 Comparing | 6 Speaking-Signaling | 6 Feeding-Offbearing |
| 7 (No significant | 7 Serving | 7 Handling |
| 8 relationship) | 8 No significant relationship | 8 No significant relationship |

[1]Dictionary of Occupational Titles, Volume II., Washington, D.C.: Government Printing Office, 1965, Pp. 649-650.

DATA: Information, knowledge, and conceptions, related to data, people, or things, obtained by observation, investigation, interpretation, visualization, mental creation; incapable of being touched; written data take the form of numbers, words, symbols, other data are ideas; concepts, oral verbalization.

0 Synthesizing: Integrating analyses of data to discover facts and/or develop knowledge concepts of interpretations.

1 Coordinating: Determining time, place, and sequence of operations or action to be taken on the basis of analysis of data; executing determinations and/or reporting on events.

2 Analyzing: Examining and evaluating data. Presenting alternative actions in relation to the evaluation is frequently involved.

3 Compiling: Gathering, collating, or classifying information about data, people, or things. Reporting and/or carrying out a prescribed action in relation to the information is frequently involved.

4 Computing: Performing arithmetic operations and reporting on and/or carrying out a prescribed action in relation to them. Does not include counting.

5 Copying: Transcribing, entering, or posting data.

6 Comparing: Judging the readily observable functional, structural, or compositional characteristics (whether similar to or divergent from obvious standards) of data, people, or things.

PEOPLE: Human beings; also animals dealt with on an individual basis as if they were human.

0 Mentoring: Dealing with individuals in terms of their total personality in order to advise, counsel, and/or guide them with regard to problems that may be resolved by legal, scientific, clinical, spiritual, and/or other professional principles.

1 Negotiating: Exchanging ideas, information, and opinions with others to formulate policies and programs and/or arrive jointly at decisions, conclusions, or solutions.

2 Instructing: Teaching subject matter to others, or training others (including animals) through explanation, demonstration, and supervised practice; or making recommendations on the basis of technical disciplines.

3 Supervising: Determining or interpreting work procedures for a group of workers, assigning specific duties to them, maintaining harmonious relations among them, and promoting efficiency.

4 Diverting: Amusing others.

5 Persuading: Influencing others in favor of a product, service, or point of view.

6 Speaking-Signaling: Talking with and/or signaling people to convey or exchange information. Includes giving assignments and/or directions to helpers or assistants.

7 Serving: Attending to the needs or requests of people or animals or the expressed or implicit wishes of people. Immediate response is involved.

THINGS: Inanimate objects as distinguished from human beings; substances or materials; machines, tools, equipment; products. A thing is tangible and has shape, form, and other physical characteristics.

0 Setting Up: Adjusting machines or equipment by replacing or altering tools, jigs, fixtures, and attachments to prepare them to perform their functions, change their performance, or restore their proper functioning if they break down. Workers who set up one or a number of machines for other workers or who set up and personally operate a variety of machines are included here.

1 Precision Working: Using body members and/or tools or work aids to work, move, guide, or place objects or materials in situations where ultimate responsibility for the attainment of standards occurs and selection of appropriate tools, objects, or materials, and the adjustment of the tool to the task require exercise of considerable judgment.

2 Operating-Controlling: Starting, stopping, controlling, and adjusting the progress of machines or equipment designed to fabricate and/or process objects or materials. Operating machines involves setting up the machine and adjusting the machine or material as the work progresses. Controlling equipment involves observing gages, dials, etc., and turning valves and other devices to control such factors as temperature, pressure, flow of liquids, speed of pumps, and reactions of materials. Setup involves several variables and adjustment is more frequent than in tending.

3 Driving-Operating: Starting, stopping, and controlling the actions of machines or equipment for which a course must be steered, or which must be guided, in order to fabricate and/or move things or people. Involves such activities as observing gages and dials; estimating distances and determining speed and direction of other objects; turning cranks and wheels; pushing clutches or brakes; and pushing or pulling gear lifts or levers. Includes such machines as cranes, conveyor systems, tractors, furnace charging machines, paving machines

and hoisting machines. Excludes manually powered machines, such as handtrucks and dollies, and power assisted machines, such as electric wheelbarrows and handtrucks.

4 Manipulating: Using body members, tools, or special devices to work, move, guide, or place objects or materials. Involves some latitude for judgment with regard to precision attained and selecting appropriate tool, object, or material, although this is readily manifest.

5 Tending: Starting, stopping, and observing the functioning of machines and equipment. Involves adjusting materials or controls of the machine, such as changing guides, adjusting timers and temperature gages, turning valves to allow flow of materials, and flipping switches in response to lights. Little judgment is involved in making these adjustments.

6 Feeding-Offbearing: Inserting, throwing, dumping, or placing materials in or removing them from machines or equipment which are automatic or tended or operated by other workers.

7 Handling: Using body members, handtools, and/or special devices to work, move, or carry objects or materials. Involves little or no latitude for judgment with regard to attainment of standards or in selecting appropriate tool, object, or material.

NOTE: Included in the concept of Feeding-Offbearing, Tending, Operating-Controlling, and Setting-Up is the situation in which the worker is actually part of the setup of the machine, either as the holder and guider of the material or holder and guider of the tool.

## The Animal School
## The Administration of the School Curriculum
## With Reference to Individual Differences

Once upon a time, the animals decided they must do something heroic to meet the problems of a "new world". So they organized a school.

They adopted an activity curriculum consisting of running, climbing, swimming and flying. To make it easier to administer the curriculum, <u>all</u> the animals took <u>all</u> the subjects.

The duck was excellent in swimming, in fact better than his instructor; but he made only passing grades in flying and was very poor in running. Since he was slow in running, he had to stay after school and also drop swimming in order to practice running. This was kept up until his web feet were badly worn and he was only average in swimming. <u>But average was acceptable in school, so nobody worried about that except the duck</u>.

The rabbit started at the top of the class in running, but had a nervous breakdown because of so much make-up work in swimming.

The squirrel was excellent in climbing until he developed frustration in the flying class where his teacher made him start from the ground up instead of from the treetop down. He also developed "charlie horses" from overexertion and then got a C in climbing and a D in running.

The eagle was a problem child and was disciplined severely. In the climbing class he beat all the others to the top of the tree, but insisted on using his own way to get there.

At the end of the year, an abnormal eel that could swim exceedingly well, and also run, climb, and fly a little had the highest average and was valedictorian.

The prairie dogs stayed out of school and fought the tax levy because the administration would not add digging and burrowing to the curriculum. They apprenticed their child to a badger and later joined the groundhogs and gophers to start a successful private school.

Does this fable have a moral?

- O. H. Reavis

## Poor Scholar's Soliloquy

No, I'm not very good in school. This is my second year in the seventh grade and I'm bigger and taller than the other kids. They like me all right, though, even if I don't say much in the schoolroom, because outside I can tell them how to do lots of things. They tag around me and that sort of makes up for what goes on in school.

I don't know why the teachers don't like me. They never have very much. Seems like they don't think you know anything unless you can name the book it comes out of. I've got a lot of books in my own room at home--books like POPULAR SCIENCE, MECHANICAL ENCYCLOPEDIA, and the Sears' and Ward's catalogues, but I don't very often just sit down and read them through like they make us do in school. I use my books when I want to find something out, like whenever Mom buys anything secondhand I look it up in Sears' or Ward's first and tell her if she's getting stung or not. I can use the index in a hurry to find the things I want.

In school, though, we've got to learn whatever is in the book and I just can't memorize stuff. Last year I stayed after school every night for two weeks trying to learn the names of the Presidents. Of course I knew some of them like Jefferson and Washington and Lincoln, but there must have been thirty altogether and I never did get them straight.

I'm not too sorry though because the kids who learned the Presidents had to turn right around and learn all the Vice-Presidents. I am taking the seventh grade over but our teacher this year isn't so interested in the names of the Presidents. She has us trying to learn the names of all the great American inventors.

Kids Seemed Interested

I guess I can't remember names in history. Anyway, this year I've been trying to learn about trucks because my uncle owns three and he says I can drive one when I'm sixteen. I already know the horsepower and number of forward and backward speeds of twenty-six American trucks, some of them Diesels, and I can spot each make a long way off. It's funny how that Diesel works. I started to tell my teacher about it last Wednesday in science class when the pump we were using to make a vacuum in a bell jar got hot, but she said she didn't see what a Diesel engine had to do with our experiment on air pressure so I just kept still. The kids seemed interested though. I took four of them around to my uncle's garage after school and we saw the mechanic, Gus, tearing a big truck Diesel down. Boy, does he know his stuff.

I'm not very good in geography either. They call it economic geography this year. We've been studying the imports and exports of Chile all week but I couldn't tell you what they are. Maybe the reason is I had to miss school yesterday because my uncle took me and his big trailer truck down state about 200 miles and we brought almost ten tons of stock to the Chicago market.

He had told me where we were going and I had to figure out the highways to take and also the mileage. He didn't do anything but drive and turn where I told him to. Was that fun! I sat with a map in my lap and told him to drive south or southeast or some other direction. We made seven stops and drove over 500 miles round trip. I'm figuring now what his oil cost and also the wear and tear on the truck - he calls it depreciation - so we'll know how much we made.

I even write out all the bills and send letters to the farmers about what their pigs and beef cattle brought at the stockyards. I only made three mistakes in 17 letters last time, my aunt said - all commas. She's been through high school and reads them over. I wish I could write school themes that way. The last one I had to write was on, "What a Daffodil Thinks of Spring," and I just couldn't get going.

I don't do very well in arithmetic either. Seems I just can't keep my mind on the problems. We had one the other day like this:

> If a 57 foot telephone pole falls across a cement highway so that 17 3/6 feet extend from one side and 14 9/17 feet from the other, how wide is the highway?

That seemed to me like an awfully silly way to get the width of a highway. I didn't even try to answer it because it didn't say whether the pole had fallen straight across or not.

Not Getting Any Younger

Even in shop I didn't get very good grades. All of us kids made a broom holder and a book-end this term and mine was sloppy. I just couldn't get interested. Mom doesn't use a broom anymore with her new vacuum cleaner and all our books are in a bookcase with glass doors in the parlor. Anyway, I wanted to make an end gate for my uncle's trailer but the shopteacher said that meant using metal and wood both and I'd have to learn how to work with wood first. I didn't see why but I kept still and made a tie rack at school, and the tail gate after school at my uncle's garage. He said I saved him $10.

Civics is hard for me, too. I've been staying after school trying to learn the "Articles of Confederation" for almost a week because the teacher said we couldn't be good citizens unless we did. I really tried, because I want to be a good citizen. I didn't have to stay after school, though, because a bunch of us boys from the south end of town have been cleaning up the old lot across from Taylor's Machine Shop to make a playground out of it for the little kids from the Methodist home. I made a jungle gym from old pipe and the guys made me Grand Mogul to keep the playground going. We raised enough money collecting scrap this month to build a wire fence clear around the lot.

Dad says I can quit school when I'm fifteen and I'm sort of anxious to because there are a lot of things I want to learn how to do and as my uncle says, I'm not getting any younger.

- Stephen M. Corey

The Voice of the Low I.Q.

"Yeah, I'm in the special class this term. Sure, I like it all right; we have lots of fun and the work's got some sense to it. I do it. Why did I get put there? Well, I ain't so sure. The report said I had a low I.Q. but nobody noticed it till last spring when I couldn't get along in Miss Brown's class. She gave me the test and when I handed in my paper she looked at it and said, "Just what I thought. I knew he didn't belong in here."

Yeah, it was something they call an Intelligence Test. It was awfully funny. At first I thought it was just a joke but it turned out it wasn't. You had to put crosses on pictures and circles under 'em and lines around 'em and dots over 'em. There was sentences to write yes or no after sentences like this: "A carpenter builds houses." I

wrote "No" because my old man's a carpenter and he ain't built a house in four years. He's workin' on the railroad track. The boy that sat next to me put No on every other sentence and then filled the rest up with Yes. He got a swell mark. I read so slow I only got four done before the time was up. I get so tired of bein' hurried up all the time.

A tree, a fish, a cake of ice.

Look at this. It was so funny I tore out the page and kept it. See, three pictures - a tree - a fish - and a cake of ice. I'll read what it tells you to do. "John is ten years old and his sister Mary is eight. If John is not Mary's brother draw a line from the fish to the cake of ice. If Mary and John are twins write your middle name under the tree and if you have no middle name put zero there. If they are not twins print your last name on the tree. If Mary is younger than John is write the Roman number eight in the upper left hand corner of the paper but if John is older than Mary draw a cat in the lower right-hand corner. If they both go to school write your full name at the bottom of the paper." I'm never sure just how to spell my name so I didn't even try this one.

Miss Brown didn't like it because I always asked a lotta questions. She thought I was bein' fresh, but I wasn't. There's a lotta things I want to know about. I never got mad when she asked me questions all the time. I answered 'em. I've got lots of answers - but they always seem to fit the wrong questions. Anyway, everything's a changin' all the time so what's the use of learnin' a lotta things today when maybe they won't even be true by tomorrow. I know heaps of things Miss Brown doesn't know - like where to find birds' nests, and how to fix a leaky pipe and what the baseball scores are. She has to send for the janitor when the lights go out or a window shade tears. I can do lots of things if I don't have to read how in a book first.

Sure I'm glad I'm in the special class. I get lots more attention. Seems like if you're awful smart or awful dumb they do alot for you in school, but if you're what they call "Normal" they just leave you sit.

I heard the school psychologist - that's a man that comes in just before promotion and tells the teachers why they're not promotin' us - he told Miss Brown it was on account of my grandfather and the rest of my ancestors. She said wasn't it kinda late to do anything about that now, and he said it was but I must have the proper trainin' so I'd be a good ancestor.

Gosh, I don't want to be no ancestor. I'm gointa be a plumber!"

- Author Unknown

The Point of View

College Professor:

Such rawness in a student is a shame.
Lack of preparation in high school is to blame.

High School Teacher:

Good heavens, what a crudity; the boy's a fool.
The fault, of course, is the grammar school.

Grammar School Teacher:

From such stupidity may I be spared.
They send them to me so unprepared.

Primary Teacher:

Kindergarten preparation that they call.
Why it's worse than none at all.

Kindergarten Teacher:

Such lack of training never did I see.
What kind of woman must his mother be?

The Boy's Mother:

Poor helpless child. He's not to blame.
His father's people are all just the same.

- Adapted from a verse by an unknown author

## SOCIAL FORCES AND THEIR IMPACT ON THE EDUCATIONAL PROCESS

Jacob Stern[1]

We've been talking about educational objectives and working with a concept called a hierarcy of objectives from the general to the specific. You've seen some examples of these as developed to some degree displayed out on the walls in the hall. I believe you also have some notion about the array of educational objectives that can be designed for any instructional purposes, any larger goal, if you will.

This morning I presented the concept of subordinance and dominance as related to educational objectives. Briefly, I indicated that this was one tool to use in making judgments about the distribution of

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resources among the educational objectives that are selected for an instructional program. An assessment should be made about the relative subordinance and dominance of adjacent objectives in the hierarchy. In making such judgments questions posed by the various social forces that are at work at any point in time, or that may be projected into the immediate or distant future, should be considered.

As we concern ourselves with the learner and learning I think it is appropriate to give some consideration to the kinds of social forces that are at work; the storms that buffet us in our daily lives. This should not be just an academic exercise. There is a strong tendency to ritualistically consider certain questions and once having considered these questions in this manner our guilt is in some way assuaged. We can then set our concerns on the shelf and say, "Yes, we did concern ourselves with social forces; Yes, we did concern ourselves with individual differences; Yes, we did write our objectives. Now, having done all the right things let's go back and teach school." I'm concerned here that we do not consider social forces in such an artificial fashion, but that we try to really draw lessons from these social forces in terms of learning, in terms of the curriculum, in terms of what happens between learner and learner, between teacher and learner and so forth. So, we will talk about some big things this afternoon, but the idea is always what is the relevance of all these "big things" to what goes on inside the classroom? Whether it be a classroom for LPN's or whether it be a classroom for any other group.

I think nearly anyone can draw up their own laundry list of major social forces that are operating in society today. I'm going to identify six or eight of these and use them as a kind of a spring board. Then, I want to stretch out one or two of them and see what this means for health occupations education.

One of the things that we are constantly reminded of as being a social force to reckon with in contemporary society is this business of the knowledge explosion. It's out of this knowledge explosion that technological change eminates, in part. One result of this is tensions that build up and a kind of fracturing which takes place in certain occupational groups. So, if we look at that social force, the explosion of knowledge, we want to see what affect this has on certain technologies and what affect modifications made in the technologies have on the occupations. Then, of course, there are further affects on the instructional programs that draw their content from those technologies.

Another social force that we have become increasingly aware of is the backlash against social injustice. There is an increased concern for residual pockets, some quite substantial, of social inequality that exist amongst us. This is a powerful social force and there are many efforts underway to cope with this particular group of social problems.

Many of these efforts find their place ultimately at the doorstep of education, and increasingly at the doorstep of vocational and technical education.

The third social force that I want to high light as an introduction to this topic is what might be called a revolution in aspirations. I think that this is something that needs to be coped with. We need to be aware that people are aspiring to improve their station in life, materially, socially and in every other way. This applies pressure to all social institutions, just as all of these forces do, and responses to these forces are necessary by each of the social institutions. I would parenthetically comment that the vitality of a social institution, such as education, may in part be measured by its ability to respond to such social forces. To the degree that a social institution is inured to, or oblivious to, or unresponsive to such social forces; to this extent we might say that this particular social institution is dysfunctional in society and may be dwindling in importance, when compared with other social institutions. Another parenthetical remark here. We sometimes find social institutions vying with one another for these functions. We see functions that were previously performed by one social institution being absorbed by some other social institution which is better able to deal with these questions.

Another social force that should be reckoned with in this connection is the increasing concern over environmental conditions. We talk about pollution, the concern about waters, streams, the atmosphere and so forth. All of these are of tremendous importance and have implications for us in curriculum development and in the organization of learning experiences.

There is an increased sense of international awareness that we are unable to minimize. This is a force that has been of some long duration in the United States. There is a sense of awareness for the plight of other people; people of other lands. We have an increased sensitivity to what might be done to assist them in obtaining their aspirations, and to the fluxuations and conflicts in all corners of the globe. There is a much greater sense of awareness of this kind of a "family of man" feeling then there was some time ago.

Another thing that we might want to give some consideration to as we set the stage for this unit is what might be called a revolution in ethics. What is right, what is good, what is moral, what is ethical behavior? What kinds of ethical behavior ought responsible agents of society attempt to foster? How might the educational agents enter into this conflict of ethics that is churning amongst us today?

Also an area which is not new, but one each generation faces anew is the inter-generation conflict. There was a television program about a week ago called "Father and Son;" some of you may have seen it.

Certainly not a new issue, but one that may have assumed some increase in magnitude, some increase in revelance, for understanding contemporary affairs.

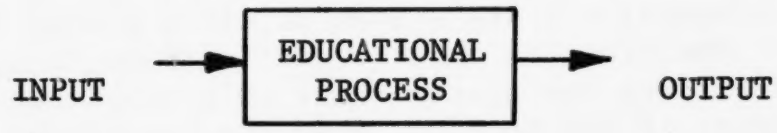
Now, what kinds of implications might these social forces have for our attempts to improve the instructional programs in our own field, whatever the field may be? We look, for example, at the question of environmental conditions. The conditions of our environment are a vital consideration in terms of the overall health of the American people. There is a movement in the direction of environmental control technologies. This suggests that curricula will need to be designed to prepare people to function in these capacities, as concern for environmental conditions becomes more accute. Short of establishing special curricula that concern themselves with environmental conditions, it may be appropriate to reconsider existing curricula with the view toward including units dealing with environmental control as they may be thought to be appropriate.

We take a look at the question of the revolution in aspirations and ask ourselves, "What possible significance does this have for us in the field of health occupations education?" It means that more and more people are looking for ladders; that is, ways of improving, by however they define that term, "their station in life." We need, it seems to me, to look about ourselves and see if there are ladders in our baliwick that might be used. How might we perhaps point the way to some of them? How might we best straighten the ladders so as to provide vehicles for this revolution in aspirations?

These are some of the considerations relative to social forces that I want to call to your attention. Hopefully, this has some value for us in trying to resolve the subordinance-dominance questions regarding educational objectives. I would also hope it will render educational institutions more relevant to contemporary society. We don't want to lean too heavily on the word relevance, but earlier in the week someone made a strong point, and rightfully so, that educational programs must be constantly re-examined for their relevance to contemporary society. Certainly a lack of awareness for some of the kinds of things that I have mentioned will render us less and less relevant to contemporary needs.

I think there is kind of a disjunction here that I wasn't really fully aware of. The second facet of this introduction to modular unit three has to do with the major considerations in instructional programs, and a way of looking at instructional programs. One of the ways in which we might look at instructional programs is through what has been called a input-process-output model. Just as social forces are one of the input specifications, similarly educational institutions must in some way incorporate consideration for social forces in the output

specifications. There are other kinds of inputs and other kinds of outputs that contribute to this equation. I don't know that it is really necessary to diagram the input-process-output model, but it may help me to bang on the chalk board.




What we mean by the process is what some have called the interactions, the transactions. Certainly some of the input characteristics, input factors, are what Bob Stake (The University of Illinois, College of Education) calls the anticident factors. The output specifications are what we have referred to as educational objectives, and what we have been trying to put some handles on by increasing the specifications of the output.

A point was made earlier in the week which makes a good example to demonstrate the use of this model. This was the case where a program in health occupations education was quite successful and had become over subscribed. There were considerably more applicants for the program than could be accommodated, and as a result those persons who were giving leadership to this program decided to raise the standards of admission to the program. They had raised the cut-off point to an I.Q. of 120. I think this is reported correctly, but any case the input specification was arbitarily modified in response to this overwhelming influx of applicants. If one looks at the input-process-output model in an educational context, and as a mathematical equation, then I think it's necessary for a person to say, "If you change the nature of the input it behooves us to change either the process or the output." I did not hear in the above report whether the process or the output were changed to accommodate, to account for, the changes in the input specifications. I doubt that they were.

After such a change we are dealing with a much more select group of candidates, and there are a number of recourses that are possible. One, it is possible to increase the level of expectations, the outcomes. We might increase the qualitative aspects of the criterion measurements used for the behavioral objectives. An original behavioral objective may have been that the candidate will adjust an apparatus to within plus or minus two percent. If you have a more sophisticated input it may be possible to sat that the candidate will adjust the apparatus to within an accuracy of plus or minus one percent. Another alternative would be to decide that he will master this competency in one-half the time. He'll master this in fifteen minutes as against twenty-five minutes which was the previously alloted time. Or, you may require that he'll do it right 99 times out of 100 instead of only 90 times out of 100.

Adjusting the input characteristics necessitates some kind of a change either in the process or in the output. In terms of the process we might say that since we're starting off with a fast group of horses it may be possible to collaps this program from 60 instructional hours to 45 instructional hours. All too often when the changing specifications are to the advantage of the system no other change is pursued or deemed necessary. But when the input specifications change to make things more difficult for the system there is a great hue and cry made to modify the process or the output. When the candidates we are receiving are much lower in intellectual capability, we want more time if we must obtain the same levels of competency, or if the time and resources are constant then we cannot obtain the same level of output specifications.

The point I want to make is that social forces are input factors insofar as this equation is concerned. If there is indeed a revolution in aspirations then the input specifications may be changing in our programs due to that social force. Changes in input specifications justify a re-examination of the process and the output. We might be able to set the parameters for the specifications of the input such that as long as they do not deviate from this-to-this the process we have established is reasonable and will work. But, when we start to deviate beyond the specified amount it becomes necessary to take a fresh look at the process or at the outcomes that are anticipated for the program.

What I have tried to do by way of an introduction is to relate the instructional program to the learner. The emphasis on the input specifications should give us some opportunity to examine the student characteristics of the groups that we are serving.

## SOCIAL FORCES AND THEIR IMPACT ON THE STUDENT

Michael Masucci[1]

As I sat here listening to Jake Stern, I recognized that I too could come up with a list of social forces; one which would include Jake's six social forces. When I came to the Institute I didn't know for sure what I would do. I know about two or three hundred things I'd like to do, but I didn't know what I'd be allowed to do. So, I have been kind of fishing around for a couple of weeks, and again today. I think, with permission of the staff--I'm not usually this deferent, but

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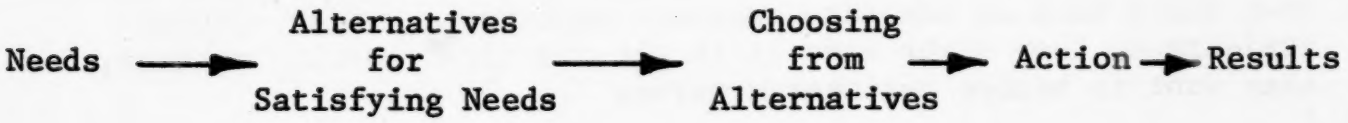
I will be today since I'm somewhat out of my element--I will focus on the individual and the way he can internalize all these social forces. With your cooperation, starting today and continuing tomorrow, I would like to see us use ourselves as the data for understanding others, and especially the others with whom we work.

That much should give away something of my background. I'm a counselling psychologist. I'm putting myself on the line for you to ask questions and interact with me in any way you care to, or dare to. I do a lot of sensitivity training. I don't like mincing words. I like to deal with issues exactly where they are. My last experience was working with para-professional people, counselor aides in the Employment Service. They sometimes seem, in laymen's terms, to be one notch above juvenile delinquents. When I was listening to Jake's group interact a little bit ago they were talking about attitudes and social distance between registered nurses and nurse aides. I think I can draw an analogy between this and the situation between counselors and counselor aides; so, the problems you probably see as unique to yourself are not unique at all. All these forces that are affecting you in the health occupations are occuring in most any occupational area functioning today.

My educational objective is to assist you to take a look at the way these social forces are personalized in us, then perhaps afterwards we can generalize these to others.

I always try to simplify every problem; it makes things easier for me. Human development is nothing more than a compilation of human acts, and all acts, as I see it, are for the same purpose. I'm going to put down the process of development, as I see it. The diagram below shows a model I would like to discuss with you. Needs range from basic physical needs all the way up to what Abraham Maslow calls self-actualization. If these needs are not met, at the level they need to be met, then man ceases to exist.

MODEL




In order for needs to be satisfied there must be alternatives. The next step is that of choosing from the alternatives, which is followed by action and then results. Another step which could be inserted at the right would be the evaluation of the results.

For man to develop or progress the result must do him some good. My point is that no man does things which are going to hurt him. He must see that what he does is going to do him some good.

The first step in the process is developing an identity. Before a person can answer as such, he must see himself as a person. This has some implication for many of the lower level jobs, in any occupation. To the extent that an individual doesn't say, "I do this, this, and this because I get these kinds of satisfactions," he has interpreted what has happened as depersonalization. He no longer has an identity. He doesn't talk about what he does, but what an orderly does. The reference is to his role rather than to himself in that role.

What kind of implications does this have for me as a person who has needs? Let's say that I'm black, I'm from the ghetto. I didn't have much of an education and suddenly I'm bombarded with television programs with all kinds of pleas to get out and get an education. I see other people driving certain kinds of cars, wearing certain kinds of clothes, talking about nice occupations, and now I aspire to some of that. At the same time, I realize I don't have the credentials to get into those jobs. In learning terms, I don't have the mediational units. I don't have anything to build on. Maybe I went through sixth grade, but psychologically dropped out at second grade.

Now, you are going to get some of these people. What do you need to know about how they feel before you can start teaching them. You need to know something of their frustrations. I felt some frustrations on the way here. I wished I knew more about the health occupations. I do this all the time; I need to be able to generalize from my own experience to others. The individual described above certainly has needs, but what about his alternatives for satisfying those needs? He may see many alternatives, but become highly frustrated because there are so many resources he doesn't have. This may be the type of thing which leads to the looting during the riots. I feel the knowledge explosion directly causes the revolution in aspirations.

(Participant: "How can we help those individuals? As an example, we get inner-city students in associate degree nursing programs who just don't have an adequate academic background. With special assistance, they might make it in the practical nursing program, but they want to become registered nurses.")

I think our own need to be of social service sometimes makes us try to do more than we can. You will have students who, no matter how hard you try, will not succeed. As I see it, the first task for each of us is to know ourselves. To know what we can do, and not overstep that. This is a real killer with educators, nurses and with other "people helpers." They become frustrated when they can't succeed with everyone with whom they have contact. One of my biggest jobs with counselors is to teach them that the best they can do, is the best they

can do. You are successful if you do that much, even if the client walks out on you.

(Duane Anderson: I would like to add something if I might. We are all concerned with what we can do for this person who can't achieve at the level to which they aspire, or at the level with someone, possibly an administrator, has placed them. It is possible that the health occupations areas, or field, is not the place for all of these people. Maybe we've got to recognize that there is another responsibility which we have. I'm not a vocational educator, but I'm sick and tired of people saying, "Put those that can't learn into vocational education." I think we've got to recognize that even in the lowest occupational level that you offer, you can't provide for every individual. Maybe there are other parts of the institution that should pick up some of the responsibility. I'm not sure just what the responsibility of the institution is, but there are places where people are trying to do something in other kinds of programs. Maybe you've got to say, "Look, we do have some requirements for our associate degree program and someone else has to take on this other responsibility.")

I'd like to reinforce that by saying that probably we look for success rates with people who have less experience in the same manner as those with more experience. This may be what causes some of our frustrations.

(Editor's note: This brief paper is an edited version of the actual activity. The author used a mode of presentation which involved many of the participants and some of the staff in the discussion. It was necessary to limit the input to this document; therefore, an attempt has been made to include the major concerns discussed and show the group interaction without presenting a type-script of the entire presentation.)

## THE PROCESS OF LEARNING

Duane Anderson[1]

Yesterday I was supposed to make a small contribution dealing with the "process" part of the "input-process-output" model that Jake Stern presented. If you remember, we had a box in the middle which we called the "educational process." This "process" to me is teaching, and perhaps this is one of the central things we should deal with this morning. We are going to be talking about the student's characteristics and

[1]Dr. Anderson is, Assistant Professor, College of Education, The University of Iowa.

abilities, but I think we should spend some time discussing the process area because it is really the crux of our conference.

I was prepared to try to answer the question, "What is the process of teaching?" I suppose I was also prepared to discuss, either in a large group or a small group - and this is a very difficult question - "How to teach." Yesterday I was presented with a difficult question by my group, they asked the question, "Why teach?" I've never been faced with that particular question before. I have been a president of a teacher's college and I work now with the EPDA program at The University of Iowa, where we prepare community college teachers. In both instances the students, the raw product, the input, came to me knowing "why," and wanted to know the "what" and the "how." It was almost outside my frame of reference to consider that some of the people, while viewing themselves as professionals, or para-professional, or I should say health specialty workers, find the role of teacher foreign or even distasteful to them. They see themselves as radiologists, med. techs., nurses or whatever else they might be and it is a rather difficult concept to structure in their minds that now they are going to be teachers. I suppose that the question has to be answered and I am assuming that you, as teachers of teachers, are going to have to somehow answer it, either through explanation or demonstration, why they should teach. I've really searched my experience, my background, to come up with some answers to this question. They range, I'm sure, all the way from the very simple "Well-you-gotta-be-somewhere" kind of approach to the very complicated answer which I really believe in, "It's the most valuable thing you can do with your skill or your knowledge as a nurse, as a medical technician, as a radiologist." As a health specialist you serve perhaps hundreds, or even thousands of people yet as a teacher of a health specialty you can influence millions of people.

I think we're getting off into the social value kind of objectives we discussed earlier, but I really believe in this. If you will, it is grabbing a little piece of immortality - excuse the religious connotation from this - I really believe it though. Those of you who have taught probably get a thrill from watching a student perform because you did something to or for him. But as a teacher of teachers, when you walk back into the classroom and see a teacher using an idea, a method, a concept that you taught him - that's also quite a thrill. You live a little bit through that particular teacher. I think it's extremely important to be able to answer to your future teachers, "Why teach?" I guess if you don't really love to teach, you certainly shouldn't be teaching teachers. You see, I think this is extremely important?

I've argued many times with people here at the University about the controversy between research and teaching; which is more important and which is more valuable. Well, we're not going to solve that particular question to my satisfaction today, even though there is a solution within the University. Often people indicate that the level of

remuneration indicates value and in the University the do re mi is in research, but perhaps that is not true in the institutions where you people are going to teach. Of course I still believe that teaching is important. Teaching is as important and valuable as research. As my coup-de-grace when I'm talking with the people at the University, - my final blow, is to remind them that the greatest teacher of all never published. Of course, they come back with, "Yes, and they crucified him, too." I assume that they have had the last word in the "why" of teaching. I do think that it is extremely important as we talk about this process of teaching that you do answer to your prospective teachers "why teach" and you'd better have this inside yourself or you're not going to be able to convince those people that this is a valuable and worthwhile use of their talents.

And now the second question, the "what" of teaching. I think we often confuse people when we begin to talk about the "what" of teaching. In order to make our point, we go too deeply, especially with new teachers who have not been oriented to teaching. We just overwhelm them by going into all the theories of learning, all the framework, all the problems connected with psychology, philosophy, the nature of man, etc. I think my wife is a good example of a person who is thus overwhelmed. She still believes, of course I keep her this way, that I go into a closed room and come up with ideas of how to teach and then get up in front of a group of students and perform some kind of magical act. Well, maybe those of us in teacher preparation programs have perpetuated this. Perhaps you know of some other professions that go behind closed doors and perform their acts and give the impression to the public that it is a mysterious operation that ordinary mortals know nothing about. If we're going to teach teachers, we should attempt to make it as simple as we possibly can. There is no sense in telling them more than they have to know about teaching, at least in the very beginning. I would suggest that there are only three major elements in teaching. This is the way I would begin, if I were talking to professionals, who came from other disciplines, about teaching.

I would say that there are only three elements: first of all, there is something to be learned. And this they already have. They have a definite objective, a focal point, for everything that you are going to do. Secondly, the action by which the student learns it. Here a psychologically correct learning experience is required for every objective. Now this is where we start getting off, for instance, into the mystical part. What are the psychologically correct experiences? This is what we're talking about when we get to the "how" of teaching. These are the techniques that we use. And then third, the degree to which the student is receptive to the learning experience. These are the three elements in the teaching process: something to teach, the action of teaching and the receiver. Of course, all three are quite complicated when you start delving into the mystical area of the theorist.

This simple definition, maybe simple-minded more than anything else, is what I use as my definition of teaching: "Teaching is whatever the teacher has to do to get the students to do whatever they have to do to learn something." That's teaching. Now there's a wide range of activities that might fall into this particular act of teaching. We sometimes have to perform, sometimes have to cajole, sometimes have to threaten, sometimes have to do quite a number of things, but all could be legitimately classified as teaching - if they get the student to learn something. I've been on all the theory kicks of teaching. This is the really sad part of teaching, the fact that we get carried away or enamored by some new approach. Those of you who are not in teaching, probably don't realize it as much as some of us who have been in teaching. This is a pendulum kind of thing - we get wild ideas, "Progressive education" with a capitol "P" was one of these kicks. Teachers are inflicted with some strange characteristics. They jump on the band wagon and they seem to loose their rationality. They pick up a technique or a method and attempt to do everything that way. Talking about teaching methods, we're reaching the point now, where computer-assisted instruction is the Thing. It seems as though everybody is willing to jump on the systems approach - computer assisted instruction. They're just sure that it's going to take over the whole industry. I suppose if we use our common sense a little bit, we can go back and see that at one time teaching had to be a direct confrontation with the student. There were no books, none of the present day tools. I'm sure that after the Gutenberg press was invented, the harbingers of doom yelled, "There goes the end of teaching. Why, we won't need teachers any longer because all you have to do is pick up a book and you'll learn. It'll be all book." But someone realized that it wasn't all book. There was more to teaching than just using books. Many of you were engaged in the process of learning when the 16mm projector came out. Everybody was sure that this was the only way to teach. We're just going to stop all other procedures and the process of teaching would suddenly consist of getting up in front, introducing the film, switching on the projector and teaching would be accomplished. Now we're running the same race on another track - we're saying aha, we'll put the material in the computer and turn on the switch and teaching and learning will take place. Probably you know the little story about the instructor of the future coming to the Dean with the bright idea saying, "I have an idea for instruction. Why don't we take 25 students and put them in a small room and put this vibrant person up in front of them" ---Innovation--- So we get back to these many ways of teaching. At least it seems that we return again and again to some of these ideas.

Another thing that we should discuss at some length is how we teach. We should recognize that there are a number of things that influence how we teach. It's more than just a technique that we're talking about here. It seems certain that how you believe people learn affects the way you teach. This causes me to think of the teaching-learning process as two sides of the same coin. The verbs that Jake was

talking about at an earlier session, to learn and to teach, are certainly complimentary kinds of activities. I guess we have to look at the two sides of this to learn to teach coin if we are really to understand the how of teaching. We've had theories of learning for a long time. It would appear that if we really knew how people learn, that when a "new theory" of learning was "discovered," all of the old methods of teaching and all the old beliefs as to how people learn would be wiped clean. We would then take the new method of learning, if there were such a thing, and devise new teaching methods to implement that new method of learning and all of the old ones would be gone. But this is not the way it is done. We can go back and take a look at the old learning theories and it's hard to believe we could have believed these things to be true. We still have these beliefs and the techniques that were developed from them is our teaching repetoire today. They don't just disappear. We are still basing our teaching today on beliefs of learning that were obsolete before any of us in this room were born. Let me just mention a couple of these. We can identify two ancient theories that really influence teaching today. There was a theory of learning, and we still have it, called mental discipline. We believed, Plato and Aristotle believed at least, that everything was already inside man when he was born and all one had to do was to exercise it like your bicep or tricep muscles. And so it didn't really make any difference what the content of your discipline was, exercise was important. Of course we still teach Latin for that reason. You say, "Why do we teach Latin?" Oh, this is a poor group to mention that to! I forgot where I was. Because it's good for you, that's why we teach Latin. Some of you I am sure have a reason. If there is no reason for teaching a particular subject other than because it's good for you to strain a little to exercise your brain, you are using the rationale of mental discipline. It was believed that if you could learn Latin, you could learn anything because you had exercised your mind. If you lift a dumbell fifty times then you can go over and lift a pail of water fifty times and the reason you can lift the pail of water is because you exercised your muscles lifting the dumbbells. People of bygone days believed that if you exercised your mind learning Latin or Greek, then you could learn other things because you had strengthened your mind. The brain was muscled up and you could do those particular things.

We moved on in our thinking to a humanistic theory of learning. Rousseau came along and talked about the unfolding idea. Everybody is good. All you have to do is provide an opportunity for this dormant plant to unfold; provide an opportunity for them to open up, to unfold. Progressive education undoubtly came from this kind of theoretical thinking. At least it harks back to it. When teachers got up in front of their rooms and said, "What would you like to do today, children?" we found out that everything inside wasn't good and nice and beautiful. At least it was demonstrated to us that there are some things in there that are irritating to the teacher.

There was a third general theory of learning that influences the way we teach and it's still with us today. The name given to this theory was "aperception." This is the old theory of the blank tablet. All you had to do was pour information in. The more you poured in, the more learning took place, and the more the student would behave in the prescribed manner. We still have teachers, none of us of course, who have this particular concept of learning. They believe that the mind is a kind of barrel or a blank tablet; you write on the blank tablet or you fill the barrel. Certain kinds of teaching techniques have resulted, because of this belief of how people learn.

There are two major contemporary learning theories that most of us are basing our teaching on today. It is quite possible that your students will base their teaching on them also. I am not a psychologist or learning theorist and I'll probably do injustice to these theories, but one is known as stimulus-response associationism. It believes in S-R bond connections. It believes that we learn by association. There are all degrees of this. John B. Watson came along and we called his theory of learning muscle twitch psychology, because he believed that all learning took place by connecting the stimulus with the response. It does explain a lot of things and we use this theory of learning in a great deal of our teaching today. It is not wrong, it is not lesser than the other contemporary theories, but it is not complete within itself. I learned French by this particular method - association - by the shape of the word. I had no insight at all into the French language. I filled my head with associations between the work and the definition and I walked in to the examination one day, regurgitated, walked out, and believe me, I have no idea what French is all about. I can't even read the jokes in the magazines that are written in French today. I don't know French. I have no insight into French. I learned French through association. Now this doesn't make it bad. I've learned a lot of other things through association.

I remember in my undergraduate zoology class that I learned the names of the birds by association. I'm sure the objective of that teacher was to get me to be able to identify birds by their characteristics. Know how I learned the names of birds? By little clues like the third toe is broken off of the great horned owl. I put a little mark at the bottom of the stand and I did other little things. When I went back to be examined on them, they were all set out on a table and I said, "Well, the toe is broken off that one, so it must be the great horned owl." I learned to associate something with something else and I was able to learn. It's not bad necessarily but I am sure that the way I used the technique was not in keeping with the best interest of the teachers. Other examples of learning using the association theory have occurred in my anatomy classes while memorizing the names of the bones and in chemistry classes, where for instance, I associated the symbol for lead Pb. because lead is used in "Plumbing." This kind of nonsense reminds me of the botany instructor who asked the student to

give the definition of a double petunia. His response was, "Well a petunia is like a begonia; a begonia is a sausage; a sausage and battery is a crime; monkeys crime trees; tree's a crowd; a crowd makes noise; noise is something between your eyes; eyes is opposite of nays; a horse nays; a horse has a colt; when you get a colt they put you in bed with double petunia." Now that's association!

Let me show you an example of association - just to show that we do learn by association. I'm going to give you ten seconds to learn a list of very important vocabulary words that you must know in order to pass your state boards. You must know them in the proper sequence and you must be able to spell them correctly. (The words were shown one column at a time and instructions to write, or speak them or whatever was necessary in order to learn them were given.) In summary the point was made of how much eaiser it was to learn column C because of the associations involved.

| Column A | Column B | Column C |
|---|---|---|
| DOM | ART | ALL |
| NOL | MAD | WERE |
| ZOG | LAW | GLAD |
| OLO | SUN | THAT |
| SIG | DOG | JOHN |
| BIL | JOY | WON |
| BEM | NOT | THE |
| JOZ | YES | GAME |
| VOG | ONE | SO |
| GUD | HOT | QUICKLY |

The s-r association theories do have something to tell us about how people learn. As we try to teach our teachers to teach, I think we ought to be at least aware of this particular theory of learning and use it where appropriate.

Another modern theory of learning is the Gestalt or field theory. There is no actual English translation for this German word. Probably the closest we can come is the term insight. This theory operates by changing the life space of the individual. You rearrange things within the life space of the individual. I am sure that each of you has struggled and struggled with something and then - bang! - it became clear. We could call this the aha! psychology. Insight or perhaps rearranging the stimulus can be shown by this little poem by Virgil.

"LUCAT, BENE, DERDAGO
HONET BUSSIS INARO
HONOMO, DEMIS TRUX
SUMMIT COUSIN
SUMMIT DUX"

Virgil

The translation of this great Latin work becomes quite simple when you have this kind of "insight" - "Lookit, Beney, der they go. Hundred busses in a row. Oh no, Moe, them is trucks. Some mit cows 'n some mit ducks."

As we progress through the modules, you will develop some kind of theory of instruction for yourself and that theory will become the basis you will use to prepare your teachers to teach. In a new book by Brunner called "The Process of Learning" he talks about the "Theory of Instruction" and very basically describes the elements of a successful instructional pattern. We must remember that, first of all, any theory of instruction must be compatible with the theory of learning that we accept. Brunner discusses the four elements that ought to be included in your theory of instruction.

First: There has to be an understanding of the condition known as predisposition toward learning. We talk about this condition as readiness when we're referring to it in the lower grades. Other terms which must be taken into consideration as part of the first element are prerequisite, curiosity, motivation, and cultural differences. We went through a big swing at one time when we were motivating students. Then we went into the idea that motivation should be psychological motivation (illustration of the teacher motivating psychologically-getting their attention first.) As the students are culturally different, they are differently predisposed to learning. To assume that students sitting in your classroom can learn the same because you are teaching them the same is pretty absurb.

Second: Structure and form of knowledge. You must communicate how your content is put together. It's not as logical to the learner as it is to you. It does make a difference the way you structure your field if you are going to teach it in the most economical and powerful way. We also talk about economy and power in this particular sequence. Economy is the amount of information that must be held in mind in order to comprehend what you're saying. Many of our new techniques of learning are being abused on the principle that you don't force the student to hold a tremendous amount of information in his mind before "learning" something. You take him one step at a time; very, very tiny steps. They say that anybody can learn anything if you give him enough time to do it. I'd like to say nearly anyone can learn nearly anything. If you make the steps small enough, nearly anyone can learn nearly anything, given enough time. Here's a sentence - "This is the squirrel that the dog that the girl that the man loved chased." "This is the man that loved the girl that fed the dog that chased the squirrel." In the second case you don't have to remember so much until the end of the sentence to comprehend what is going on. In the first one, you have to hold everything in mind until you get to the end of the sentence. This may hold true in your teaching as well. If students don't know what the end product is, they will often have difficulty learning. They

don't know what the purpose is in a glucose test if you begin by saying that you take this chemical or this reagent and put it in here - and they have to remember that; and if you have to do this - and they've got to remember that; and finally, the results tell you whether you've got +2 or +3. Unless they have a present picture of the goal they are probably going to forget what they were attempting to do.

Third: Closely related to the way that the body of knowledge is structured is the sequence in which the materials are presented. There usually is no one best sequence of presentation for all students in any one area. Therefore, it is necessary to experiment with numerous patterns to attempt to find those that work most effectively for your students at a particular point in time.

Fourth: Form and spacing of reinforcement. Students need to have some kind of reward. This has to become part of your theory of instruction. You've got to know how to space and pace your reinforcement. It's not a mechanical kind of thing and it can easily become ineffective and thus fail to obtain the desired results. Research has shown that reward does not have to follow every action in order to promote learning. One of the dangers is building a reward system which becomes the center of the stage and the concepts to be learned are only incidental to receiving the reward.

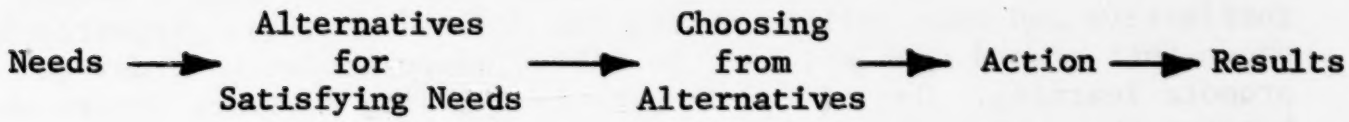
In summary, I am suggesting that you develop a theory of instruction. Then hook it to a sound theory of learning and above all that you love to teach. A research team in New York attempting to analyse the change in behavior of a group of young men who had not gotten into trouble with the law were searching for causal factors. It was found that a large number of these boys had gone to the same school and had the same teacher, long since retired. With great expectations of finding a new teaching technique or a new theory of learning, they found the teacher and attempted to determine what she did differently than her counterparts of that day. The results were disappointing. She didn't appear to have used any radically different approach in her teaching, her grading, her discipline or any other identifiable variable. Just as the young researchers were about to leave, disappointed by not having found The Answer, the old teacher mused half to herself, "I sure did love those boys." Perhaps in the final analysis, TLC counts for a great deal more than we give it credit for.

# AN APPROACH TO STUDENT SELECTION

Michael Masucci[1]

The hardest thing for anyone to do with a group of one hundred people is to answer their specific questions regarding student selection, which tests should be used, is this test valid, etc. I think I'll start by giving a rationale for selection, discuss the process of selection, include some of the gross components, and then we'll break up into small groups where you can discuss these more specifically. I have on the board the diagram we used in an earlier presentation which I believe fits this situation as well. This represents how an individual develops, but I believe the same model may be used for society. It's just another way of looking at human development.

MODEL




The first, and most critical, step in any selection process is a needs assessment. A job analysis is the most important aspect of a needs assessment. What is done? Why is it done? How is it done? Under what circumstances is it done? What devices, aides, crutches, etc., other than the human individual, must be involved? Very often you will find in the job analysis the question why is not included. I think this is important to fully understanding the job. The more specific you can be in this analysis the better able you will be to describe the type of person component you will need to do the job.

The process becomes one of data collection. Once I know what needs to be done, I can ask myself the question, "What characteristics do I need in the people in terms of the job description I have developed?" One way of looking at this, and I understand Jake Stern has discussed this with you briefly in a previous presentation, is to look at a job in terms of its relationship to data, people, and things. From the Dictionary of Occupational Titles, Volume II, Appendix A, which I understand you have been provided, the three areas of data, people, and things are broken down into more detail. I will read them briefly for you as an input to our thinking. The area of data is broken into synthesizing, coordinating, analyzing, compiling, computing, copying, and comparing. When people are working with data, they are doing one

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[1]Dr. Masucci is, Associate Professor of Education Psychology, College of Education, The University of Illinois.

of those six things. When working with people an individual is mentoring, negotiating, instructing, supervising, diverting persuading, speaking-signaling, or serving. When they are working with things they are either setting up, precision working, operating-controlling, driving-operating, manipulating, tending, feeding-offbearing, or handling. Job descriptions could well be designed around these three kinds of activities which working individuals participate in. This would be particularly useful when working with complex jobs.

One of the alternative techniques for selecting from a group of people is the interview. One of the things we need to know for the interview is what we're actually looking for in terms of the position. The interview is traditionally very subjectively oriented. There are usually one or two things we are looking for in terms of personality and we have a stereotyped idea of what the position involves. We think this is a nice guy and that he'll probably be able to do the job. We should be asking specific questions relative to could this person bend, stoop, stand-off, etc. The interview should be based on an interview schedule and all applicants asked the same questions which are aimed at ascertaining whether they can perform the various functions necessary for the position.

Again looking at the model we have specified that we have a basic need, that of selecting personnel for a particular position. This needs assessment must provide a much more detailed analysis and description of the job than a traditional Dictionary of Occupational Titles description, and this must be done by personnel employed in, or closely associated with, that field. There may also be a need for some elasticity in this description such that the position is somewhat flexible. This will allow for some variation in the individual selected and aide in their future growth in that position. Another point is that you don't once and forever classify a job, or that you don't once and forever classify a selection procedure. Any good system of job classification needs to be reviewed periodically.

Once the initial analysis and description or classification system has been established we move to the second aspect of the model and that is the selection of alternatives. What are some alternative methods for collecting the data for selection that we need? One form that we might use is test data. Also, interviews, questionnaires, references, and achievement records. The Employment Service uses a neumonic device to indicate some of the various types of data that may be gathered. It is called SKAPATI. The kinds of things you want to know about an individual are Skills, Knowledge, Abilities, Physical Characteristics, Attitudes, Traits and Interests. There is a definite need to gather different kinds of data based on the type of job. If we are considering a job which is primarily a data job this will have a definite effect on the kinds of knowledge, attitude, phsical characteristics, and interests with which we must be concerned with.

It is certainly important that the area of interests be assessed. In the past we have taken a group of individuals on welfare and done a selling job to put them into a role such as nurses aides. Subsequently we have found that many of them did not continue in this position. We would have been much better off to have spent more time discussing this position with the trainee to be assured that it fits their interests. With the availability of such devices as video-tape recording equipment it may be possible to provide prospective trainees with a relatively concise picture of the role that they might be performing in a limited amount of time.

I take a position regarding tests and tools of this nature which is somewhat over exaggerated and it may appear that I am opposed to the use of such devices. Actually, what I really see is an over dependency of people on such tools or devices. There is a definite tendency on the part of people to use these devices without adequate knowledge of the role they can perform. I don't think one should even use tests unless you know what they are capable of doing. And you shouldn't use tests at all unless you know what jobs these tests are being used for.

Few studies show personal data which can be used for prediction of those that will be successful in occupations. Theorticians do agree that final occupational choice is delayed on the average until age 23 or 27, so it is certainly understandable that we do have a higher attrition rate or success rate with individuals who go into our programs as teenagers. The success of testing as a tool has by no means proved a panacea for selecting individuals but it is a starting point.

An example of the use of tests in this area might be the selection of nurse aides using the General Aptitude Test Battery. This is the most researched test which we have available. This is test used to measure aptitude for performance. The aptitudes include general, numerical, verbal, spacial, and others. This test has been administered to many individuals in various occupations and the results have been used to establish success levels for those occupations. Scores have been identified under which the individuals probably would not succeed in particular occupations. This is a probable figure. The scores on the various aptitudes for a particular occupation are analyzed and it is found that for those who are successful sixty out of one hundred have scores above some level in identified aptitude areas. These then become the criterion by which an applicant is determined as being test selected or not. From the employment service who administers this test you can receive a test selected applicant. This means this individual has been tested and has scores compared with individuals who work on this job. The important consideration is, what use will be made of this test, for numerous studies have shown no relationship between these preassessment tests and success in an educational program or on the job.

Another important factor to consider in evaluating whether selection has been successful or not is whether we are attempting to select an individual forever or not. Granted we have very high attrition rates in some low level occupations, but we should realize that many of these positions should be considered as stepping stones to other activities and the high attrition rate is not necessarily undesirable. Unless an individual has a tremendous investment in time and energy it is natural for him to move on to something else once he has succeeded at the original task, level or position. In many cases even though the individual does not move on to a new position because of his time or investment he changes the position and expands it or revises it to suit his needs. My personal opinion is that our efforts might be better placed in other areas. You only need good selection when you don't have adequate trainers. If you can really analyze what you're trying to teach, break it off into small enough components you may be able to minimize your attention to this selection factor. I think selection is a fun game and something to play with because it is tangible and because it obsolves the teacher of making some of the decisions.

It may well be that for many of the highly skilled and specified areas, such as selecting astronauts, that we do need highly sophisticated psychological tests, but I just wonder what kind of tests we need to select ward attendants. Maybe a more practical and useful exam would be to take an applicant into an actual ward, give him very brief training on how to lift a patient, or move a patient. Following this brief training you would have the supervisors observe him in doing this and make a decision relative to whether they think the individual will work out on the job or not. When the job is nice and simple I don't think we need to complicate it, but we do. I'm not trying to say you should not use tests. I'm more concerned that you use your own critical judgment in the process. If you do test I suggest you be sure you have a background in how to administer and use the test accurately or find someone to assist you who is so trained. There has been millions of dollars spent on tests such as the Rorschach and Minnesota Multiphasic Personality Inventory (MMPI), which have very specific clinical uses. But just because these are available and we have spent this much money on them does not mean they should be used indiscriminately. There are many nursing programs which give the MMPI to every applicant that wishes to enroll in the program. When asked "why?" most nurse educators will indicate that they don't reall know why it's just part of the standard set of requirements for enrolling in this program. If a particular applicant does not reach a certain level on this test they are not accepted. To me that is not very good use of testing.

In a visit to the schools in Syracruse, New York I found that eight of twelve schools did not even know who had instigated their testing program. These tests last. Also they could not tell me what the purpose of all the tests were. Ritualistically each of these schools gave a whole battery of tests obtained the scores and filed them in the student accumulative folders.

Your tasks now for the general interests groups are to examine your existing selection proceedures and review them in light of how they might be improved.

(Editor's note: This paper is an edited version of the actual presentation as it was necessary to limit the size of this document.)

## REACTIONS TO CONCERNS EXPRESSED BY PARTICIPANTS

Michael Masucci[1]

(Editor's note: Prior to this session of the Health Occupations Education Teacher Education Institute, Dr. Masucci asked the participants to write down their concerns about the Institute to date and any other pertinent questions or concerns. His objectives were to use their own problems as a means to simulate for them the kinds of problems their students may have in approaching a new educational situation. The activity was also designed to be somewhat cathartic for a number of individuals had become somewhat concerned about their ability to absorb a large amount of material at the pace which had been set during the first three days of the Institute.

The problems or concerns are expressed in question form, topics which were discussed are sighted and in specific instances Dr. Masucci's comments are presented.)

**How can everyone participate in small group activities?**

**Discussion:**

Everyone trying to talk at the same time
Frustrations due to topics not being related to individual concerns.
Introverts and extroverts in the same group
Limited time periods

**Comments:**

Everbody here has his own separate world. A lot of us have very similar worlds and a lot of us don't. This is where I begin in terms of individual differences. We can measure every skill, attitude, trait and so forth imaginable and we come up with group differences. I

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[1]Dr. Masucci is, Associate Professor of Education Psychology, College of Education, The University of Illinois.

think that this is the basis of the underlying theory that I have. You are individuals. You all see things differently. At this moment, you are all thinking and feeling in different ways. Your feelings may be similar, or you may have the same kinds of reactions, but by and large, there are about 100 different institutes going on here.

I think probably the most significant social force that affects the way people act in small groups is that we expect from the leader everything we are going to get. When things go wrong, we look at the leader and say, "Hey, why do you let this guy talk so much." There is a need for group members to assist the leader. The single most important variable in the learning process is the attitude and/or demeanor of the instructor or the person responsible for learning. The experts don't have all the answers. You will hear people say, "I'm afraid to participate in a group because I'll end up looking stupid." So what, we all look stupid from time to time. Some people do have things to say. Maybe the people who talk need to talk. They keep rehearsing, restating, what they're thinking. Other people have no need to talk. They learn as much, or more, by listening.

How do you get individuals interested in teaching?

Discussion:

Teaching as need satisfying
Exemplary models
Exploring alternatives

How do you get psychologically "up" for making presentations?

Discussion:

Knowledge of the topic
Degree of preparation

Can "educators" teach health specialists to teach?

Discussion:

Lack of health specialty knowledge by "educators"
Problems of stereotypes
Assistance in organizing and structuring
Commonality factors in teaching

How do you tell an adult he needs remedial help?

Discussion:

Student-teacher relationship
Greater need for teachers to "know their students"

How do you tell a teacher he needs help to improve his teaching?

Discussion:

Similar to above

How can one learn if the presentor plays a game of verbal gymnastics?

Discussion:

Teachers that don't communicate
Students that don't question

Comments:

There are two basic kinds of questions. The information seeking question and the facilitative question. They can be both one and the same, but more than likely they're not. I ask questions when I feel a person has difficulties in communicating. If his words are beyond me, somehow I must free up myself to butt in and say I am unable to understand him. "What do you mean?" "Explain to me what you are trying to tell me." You can help a person like that if you have an inclination to. The other kind of question is facilitative. It calls for a reflective kind of response, repeating or clarification of a person's statement--storytelling kind of response. All interviews are composed of those two parts. Wouldn't we as teachers often do a better job if we were willing to accept interruptions. If I can't take them as they occur, I will say, "save them"; every 30 minutes I'll give you a chance to question me, so we can clarify what has happened. How we deal with people in our class is kind of an individual thing, but I think that if we do the above, all kinds of concerns will just disappear. We must allow for this. It becomes kind of a reinforcement. "Hey, I'm learning something." We want people to learn on their own initiative.

How can we cope with the problem of all programs accepting only high ability students?

Discussion:

Meeting licensure and certification standards
Fairness to the students of high ability and lower ability
High premium on success in our society
The fallacy of basing decisions on tests, particularly general abilities tests

## SUMMARY DISCUSSION: THE LEARNER AND LEARNING

Institute Staff[1]

Robert M. Tomlinson: The purpose of this session is to try and put together some of the bits and pieces of modular unit 3 on the Learner and Learning. Through a free-for-all discussion session we would like to bring together and summarize such topics and concepts as the impact of social forces, the input-output model, the needs model, the process of learning and the student selection process. "Who would like to start this off?"

Lawrence Borosage: I would like to bring up one point. We spent a great deal of time in our small group talking about the results of accepting individuals who have higher ability than what a job may necessarily call for. Maybe one of the reasons we have a substantial amount of turnover in a field is because once the individual finds himself in a position where his ability exceeds that which is called for, he is dissatisfied. From this situation you may end up with any number of things. The individual may withdraw physically, leave the position. On the other hand, there is such a thing as mental and emotional withdrawal. The individual stays in the position, but productivity drops off and you end up with a minimal worker. I think maybe I'd like to see Jake Stern do something with this because I think it has some implications from the stand point of his input-output model.

Jake Stern: You may recall that earlier I reacted to what I felt was a feeling or sense of myopia with regard to job specifications. I indicated that the package influences the product as the product influences the package. We have a tendency to look only at the negative aspects of what can be an undesirable condition--to hire a man with abilities far above what is required for the job. You have made that point, Larry, and I don't want to amplify on it. Instead, I'm going to turn it around and use it for my purposes. And that is, the package influences the product. In other words, here we've got a misfit, if you please. He can do all the kinds of bad things, psychological or physical withdrawal, as Larry pointed out, but you might find something else. He might say, "You know, there are other jobs around here that I could do in addition to the jobs that have been assigned to me." He may be an instrumentality of the re-definition of the role. All of a sudden we've got people who are functioning at a level, and performing tasks satisfactorily, above those that were expected of them. Now, you must redefine adjacent roles. That's where this whole business of the translation of related occupations must take place. Sometimes what you

[1]Several members of the H.O.E. Teacher Education Institute participated in this session which was held at the end of the module on The Learner and Learning.

have is a convergence of forces. It may be like the confluence of the holy rivers. If you've got a number of people in a given occupation who have capabilities above those which are required, and you also have a volatile technology which is imposing new functions on all personnel, then you've got a field that is right for re-distribution of functions. It seems to be a natural outgrowth to say, "We've got people around here who can do those things, so let's just cut up the pie a little bit differently."

The only reaction I wanted to make, Larry, was that it isn't all physical and psychological withdrawal, but there are some other dimensions to this thing. We can do things to either make it possible for this type of change to occur, or to prevent it from happening. I think we should be wary of the latter.

(Participant: Since we're talking about health related occupations, I wonder if you would give us an example of how something like this might work out.)

Stern: Gee, your history is loaded with them, isn't it?

(Participant: I mean contemporarily because we are now a much more volatile field than when we started.)

Lewis D. Holloway: LPN's are now being utilized at a higher level than they were prepared for. This, and other factors, are causing some people to take a real hard look at the nursing field.

(Participant: There is also a considerable degree of uncertainly in the dental field today as to what functions the supportive personnel should perform.)

Holloway: In New Zealand and England, auxiliary health workers have been filling teeth for some time. Experimental programs in this country are in operation to train "super-dental assistants" to perform this function.

Tomlinson: I think people in the health field as a group, tend to elevate their positions higher and higher, whether they need to be or not. Too often what happens is they completely ignore the facts of life. Now, just hear me out if you will. We're going to have about so many people needing so much care, whether we have people prepared or not. We are going to provide services with the best we have whether it is the local GP's office, the clinic, the twenty-five bed county hospital, or anyplace else. This is the way health service operates. Now we recognize that many of the people who are providing this service are not nearly as well prepared as we would like to have them. What seems to me to be happening is that people are being prepared at a higher and higher level, but once they are so prepared they don't want to do what needs to be done.

What it really boils down to, and Eli Ginszberg who has studied this field in depth supports this, is that there is really no shortage of nurses, and there has not been a shortage of nurses in the last twenty years. According to the very nature of the definition of a shortage, had there been a shortage, it would have been corrected before now. In analyzing this, what we have is as many nurses as we are willing to pay for. At any given point in time, had the salaries of registered nurses gone up to $12,000 per year for five years, we would have had an adequate number of nurses. The shortage is of people who are willing to work in this role for what we are willing to pay. Whether we are talking about physicians, nurses, inhalation therapist or whatever, the situation must meet the real test in the economic marketplace. From this then, it is obvious that we are willing to live with a much lower level of quality than we could provide today if we were willing to pay for it. So, we are right back to the money factor.

I would recommend you look at the study by two labor economists, Franke and Sobel, based on labor markets in St. Louis and Chicago. This study, which is listed in your bibliography, compares two fields, medical health and industrial occupations. In the industrial area, they studied machinists, tool and die makers and tool and die designers. The representatives of the medical health field were practical nurses and laboratory workers. They interviewed some 15,000 people to see if these occupations followed the traditional non-health model in labor shortage situations. What happens when you have a labor shortage in industry where these occupations are required? Industry must maintain quality. They will readjust personnel to maintain that quality. If they must have top skilled tool die makers to perform this operation to maintain quality one way or another, they are going to find them. If that means overtime, if that means paying over-scale wages, if that means bootlegging, they do it. Also, they are quick to readjust, to redescribe jobs and use lesser qualified people wherever possible to free up those who have the capabilities which are needed. The number one factor is quality; take a loss on a job if necessary to maintain quality, but to stay in business they must maintain this level of the product.

On the other hand, looking at medical help, particularly in hospitals, when you tend to have a labor shortage, the first thing sacrificed is quality. In the first place there is no established standard of quality. Secondly, you do not have financial flexibility; that is, there is an informal agreement among hospital administrators and so forth--to maintain pricing, salaries, cost levels. They are not as likely to rob each other for personnel. Health service employers use less prepared, or unprepared people to do the same job whether or not they qualify. They use the best available at the price they can pay.

Another factor is the source of supply of workers. In the industrial occupations a person may become a skilled worker through many processes,

including: hobby-work training, experience, apprenticeship, whatever. They take workers from wherever they can find them as long as they can do the job. With the health occupations where licensure is involved, there is a single pipeline of supply which has restrictions on it. There is no way to supplement. So, consequently the reserve supply to call upon, or the alternative preparation processes are not there to maintain quality. These are, I think, some of the kinds of things that we forget when we tend to become imbued in our own area. We feel we have to have higher and higher quality in each employee and in many respects price ourselves out of business. We get so many restrictions upon the process or input that the output is ignored. This is really the way the health field has tended to develop.

I would propose the principle to you, realizing that some will disagree, that every program should admit and that every job should be filled by, the lowest qualified person who can perform that job. This of course is not the approach that we tend to take.

(Participant: "I agree with what you say, but let's say that you are going to have two-thirds of your stomach removed. Who are you going to choose to do this? And who do you want to take care of you afterward?")

I don't think this question is incompatible with what I said. I want someone who is fully qualified to do that job, there's no question about that.

(Participant: "How are you going to assess quality?")

I don't intend to assess it.

(Participant: "But people do just that even though they are not qualified to do so. They hear about some guy who is a professor, head of the department of surgery, at X hospital and X medical school, and say he's my man. There may be twenty guys who could do the job, and here they are using this artificial yardstick.

Because we still have free choice, I'd like to explain the modifying factors to this and why it doesn't always work in the health professions as it does in industry. We are not dealing with a concrete entity. For instance, if you have a physical science, or if you have a physical product such as in industry, then you could predict the outcome. In medicine you can make predictions as to expected outcomes, but it is much less controllable than in a physical area.")

I think we are mixing two things here. Opportunity of choice involves two things. You see, opportunity means not only the person has the opportunity to choose from among, but there has to be something there to choose. For example, the opportunity for my wife to buy a mink coat is there. It is not a realistic opportunity. So when we talk about

opportunity, I think we too often find I don't really have a choice. If we had prepared twice as many physicians then maybe I could choose from among. You say, free choice--for whom. At least half of our population, in the economic sense, have no choice.

(Editor's note: At this point, there was a very interesting but lengthy discussion regarding the use of supportive health workers. A physician indicated that he could train an auto mechanic to remove a stomach in six months, but the critical function was deciding when or if the stomach should be removed. It was stated that it was better to give at least some preparation to these personnel, for if not people off the street are used. The economic aspects and the patient's choice as to who will provide his health service were also discussed.)

Tomlinson: I think all of this supports my original position that whatever the job is, whether it's sweeping the floor, or running a respiratory machine, it really doesn't matter so long as that person running the machine can do a very capable job. We've tended to over-elevate, over-educate, over-select. I think this was what Mike Masucci was trying to get across on testing. Each program wants the top ten percent of the students, and yet there's only one top ten percent. I would like to remind you of the point I made the other day of the difference between quality and level. We have no place for poor quality at any level.

Stern: Tommy, I think I'd like to put in my plug if I may here, for something that I'm afraid just doesn't get the kind of mileage it ought to be getting. What we are really talking about is occupational economics. Think of a chart with quality on one side and cost on the other side. Now, with each additional increment in quality the costs accelerate. I think the only way this can be handled is in an empirical fashion. If you've got a well defined hierarchy of educational objectives for a particular program, whether it's operating a respiratory pump, or removing a stomach, then you can say here are those objectives that have to be carried out. You may say, "I'm going to operate at this level of quality." If all of your objectives are going to get maximum treatment, your cost is going to be at a relatively high level. In another experimental program you could cut back on certain objectives, because you don't really think that they're that essential. You reduce your costs by this much and then check the results. I know you're going to ask whether I want it to be my stomach or not, but I really won't know, will I. I think that's the only way you can approach the answer to this problem.

Tomlinson: This is the matter of minimum quality level as Bruce Spivey referred to. Once this is established we will have to pay the cost, whatever it is. Now that quality level may need to be 99.9 out of a 100 successes if we are removing stomachs. I agree that we have to establish this level, but what I fear is that we are not really talking

about quality in some positions. We're talking about some kind of preparation for credentials, and these credentials do not necessarily relate to the quality that is required.

One of the things I am afraid we are doing in an attempt to make it look like we're getting more quality is to add more and more qualifications to enter a field. Consequently we have so few individuals prepared at levels that the great majority of people cannot have this service at all. We have made this choice in health year after year for a hundred years. Those who can afford it get more and more of it. We've been willing to ignore those others who ought to have it, but have not. To me this is what Medicare said. We were willing to accept for many years a much higher death and suffering rate than we would have had to, simply because we were not willing to pay for it. The only alternative position that I can see is that we are now providing one heck of a lot of Medicare that is not needed. Now one or the other of these positions must be true, and I still think we have much of this in our society. If the people within the health field invest our resources more and more, in fewer and fewer, by requiring higher preparation and more stringent requirements than are required to assure this minimum acceptable performance level we are doing a dis-service, not only to the health field, but to society as a whole.

The same kind of question comes up when you say, "Can we afford educational programs in the health field, or in any field?" If you take an operational situation in any one school, institution or whatever, it has a maximum amount of social resources available. It can invest in buildings, programs, the process, etc. Somewhere it's going to be invested, but they're not going to have enough money to offer all of the programs that might be offered. This is where you come to priorities. Which one do you invest in? We can go back to the student selection characteristics. Can you afford to invest in students who have a higher likelihood of failure? When you invest resources in any one group they then cannot be used on others who may have succeeded, or others that could have succeeded at another level.

The other input to this is the individual resource; that which the person invests--their energies, their efforts, their time, their money. Now, they may choose to enter a program even though they've been counselled that they are liable to fail. They have the right to this choice of how they will use their individual resources, but that doesn't mean that society should necessarily be obligated to invest its resources to provide opportunity. If we had enough of both resources, fine, but today we don't and not likely to have in the foreseeable future.

This is one side of the coin. The other is that historically we cannot tolerate failure. An example of this is the Federal Aviation Administration in their licensing of flight schools. A flight school

that may have two or three failures in a year or more is reviewed for possible revocation of its license as a school. The same kind of attitude exists to some extent in nursing and other health fields. "We can't have failures." I'm very suspicious of any school that does not have failures. This tells me that probably you have set your selection criteria so high that you are misleading the individuals, wasting their resources and wasting the social resources that are supporting that school. This is very contrary to what many schools look at, but don't tell me you haven't had a failure in three years and expect me to look at it as being a desirable characteristic. All you are doing is not selecting the students, many of whom should be there, and who probably would stay within the occupation for a longer period of time than those with very high qualifications. Industry found many years ago that the most expensive employee they can put on the payroll is the over-qualified person. They will not stay there unless you have a position you can move them up into in a relatively short period of time.

MODULAR UNIT IV

## Designing Learning Programs

**Guidelines:**

- Educational Objectives
- Instructional Strategies
- Annotated Bibliography
- Supplementary Materials
  - Instructional Activities
  - Seven Kinds of Committee Members
  - Sources of 2x2 Inch Slides for Health Occupations Education
  - Sources of Film Loops for Health Occupations Education

**Supportive Papers:**

- Curriculum Planning -- Lawrence Borosage
- Instructional Strategies -- Institute Staff
- Instructional Media -- Consultant-Presentors
- Report on Small Groups on Administration and Coordination -- Panel Participants

## EDUCATIONAL OBJECTIVES

4. Following completion of this modular unit the participant will design learning programs.

   4.1 The participant will plan curricula.

      4.1.1 Adopts a curriculum planning model.

      4.1.2 Recognizes techniques used to identify appropriate occupational content.

      4.1.3 Ascertains content for a selected portion of a specific health occupations education program.

      4.1.4 Prepares curricular materials for a selected portion of an educational program.

         4.1.4.1 Includes educational objectives as an integral part of curricular materials.

         4.1.4.2 Shows how specific materials relate to larger divisions within the curriculum.

         4.1.4.3 Considers appropriate factors for organizing and sequencing curricula.

      4.1.5 Prepares specific curricula materials for use in a micro-presentation.

   4.2 The participant will utilize appropriate instructional strategies.

      4.2.1 Selects instructional strategies.

         4.2.1.1 Recognizes the importance of planning learning experiences which are appropriate to the content to be mastered.

         4.2.1.2 Designates suitable instructional strategies for teaching selected types of content.

      4.2.2 Employs instructional strategies.

         4.2.2.1 Describes how to conduct the common types of learning experiences.

         4.2.2.2 Demonstrates competency in using selected instructional strategies.

4.3 The participant will utilize appropriate types of instructional media.

4.3.1 Shows familiarity with a variety of instructional media.

4.3.2 Identifies sources of prepared media materials.

4.3.3 Produces selected types of instructional media.

4.3.4 Demonstrates competency in using selected instructional media in an effective manner.

4.4 The participant will conduct administrative and coordination activities.

4.4.1 Utilizes advisory committees.

4.4.2 Utilizes contractual agreements between schools and affiliating agencies.

4.4.3 Works cooperatively with appropriate professional and regulatory agencies.

4.4.4 Recognizes the value of a public relations program.

4.4.5 Recognizes the need for program evaluation.

## INSTRUCTIONAL STRATEGIES

Quite a variety of learning experiences might well be used for this modular unit due to the range of topics to be covered.

The topic concerned with curriculum planning could be introduced by a general presentation to briefly describe the dimensions of a comprehensive planning system. Some type of schematic diagram or flow chart is quite helpful to illustrate relationships among the various activities which make up the planning process. The participants should be expected to develop curricular materials for a portion of an educational program, and if they will be giving micro-presentations in a latter portion of their training program it may be appropriate for them to plan that activity as a part of their assignment for this topic.

Through some type of general presentation, which would ideally include live or taped examples of a variety of instructional strategies, the participants should become acquainted with various types of teaching-learning experiences. A very important aspect of this activity

would be to develop the idea that there is a need for the educational process to fit the content. Through observation, discussion and actual experience the participant should become knowledgeable of and skilled in using a variety of instructional strategies. Micro-teaching experiences are an ideal method for developing skill in teaching. The degree of competency which should be developed at this point will depend on whether a separate activity on the educational process will be covered as is suggested by modular unit 6 of these guidelines.

A multi-media presentation would be quite appropriate to illustrate the ways in which information can be communicated through the various senses. Discussion and demonstrations on specific techniques and equipment should follow. Quite often manufacturers of instructional media are willing to demonstrate hardware and techniques for producing and using instructional media. Equipment and supplies should then be provided so that participants can become proficient in producing materials for instructional purposes.

Although the administration and coordination topic could be handled in a variety of ways, a panel of discussants representing various levels and areas of administrative responsibility is seen as particularly suitable. The panel should emphasize the need to develop harmonious working relations among the related personnel and agencies. Following the initial activity the participants should have an opportunity to discuss this topic. There would be considerable merit in having the participants review suggested guidelines, agreements, and programs which are available for the areas covered by this topic. These materials could be used to stimulate discussion as well as for background from which the participants might develop similar materials for their own programs.

## ANNOTATED BIBLIOGRAPHY

Anderson, Faust, Roderick, Cunningham, & Andre. Current research on instruction. Englewood Cliffs: Prentice-Hall, Inc., 1969.

This new collection of readings presents the best of current research on instruction, in both the laboratory and classroom. It is structured around the basic components of the instructional situation and is the only book of readings available concerned exclusively with instruction.

Audiovisual Market Place: A Multimedia Guide. New York: R.R. Bowker Co., 1969 Edition.

A directory of the Audiovisual Laboratory listing producers and distributors, equipment, services and organizations, conventions, film

festivals, publications concerned with new media -- Film/Filmstrips/ Slides/Film Loop/Tapes/Transparencies/Maps/Globes.

Banathy, B.H. Instructional Systems. Palo Alto, California: Fearon Publishers, 1968.

This book provides the program planner with a guide to using the systems approach to developing and operating instructional programs. Numerous flow charts are provided to assist in these endeavors.

Clay, D.F. Curriculum: design for learning. Indianapolis: Bobbs-Merrill, 1966.

Professor Clay examines and compares many current experiments in curriculum shaped by changing patterns in society and aimed at providing more effective designs for learning. This book surveys curriculums in a simple and understandable manner, leaving exhaustive and encyclopedic treatments for specialists in the field. This may be an introductory work, but it is one that sharply involves the reader in the current provocative debate on experimentation in our schools.

Eidell, T.L. & Klebe, J.A. (Eds.). Annotated bibliography on the evaluation of educational programs. Eugene, Oregon: ERIC Clearinghouse on Educational Administration, University of Oregon, November, 1968.

This is a compilation of selected documents on program evaluation published, for the most part, since 1964. Most of the literature emphasizes the need for careful identification of operationalized educational objectives which can be quantified by some behavioral indicator. While the accurate determination of educational outcomes remains a serious problem in evaluation some progress has been made in developing mathematical models and cost-benefit analyses for evaluative purposes.

Griffiths, D.E. Developing taxonomies of organizational behavior in educational administration. Chicago: Rand McNally, 1969.

Seven leading authorities provide educational administrators with guides for taxonomic methodology in educational administration. The articles furnish guides to help prepare administrators, to synthesize present knowledge of educational administration, and to encourage new research. The final chapter offers a synthesis and conclusions, identifying areas where additional inquiry will be most fruitful.

Harrison, R.L. Supervisory Leadership in education. New York: Van Nostrand Reinhold Co., 1968.

This book is designed for present and future supervisors at all grade levels. It emphasizes the role of the supervisor as a dynamic

leader whose main function is to promote improvement in classroom instruction. Each chapter contains two cases in supervisory problems.

Kemp, J.E. Planning and producing audiovisual materials. San Francisco: Chandler Publishing Company, 1968.

This publication provides step-by-step instructions for the planning and producing of audiovisual materials for classroom use, for self-instruction, for information programs, and for special training programs.

King, S.W. Organization and effective use of advisory committees. Vocational Division Bulletin No. 288, Trade and Industrial Education Series No. 71, Washington, D.C.: Government Printing Office, 1960.

Although this publication is designed to serve as a guide for local administrators and teachers of trade and industrial education programs, the suggestions presented should be of assistance to all who work with advisory groups.

Kone, G.A. (Ed.) 8mm FILM DIRECTORY! 1969-70. Educational Film Library Association, Inc., 1969.

This publication contains a compilation of 8mm films, regardless of length or subject matter, which are in general distribution in the United States. The Directory includes 8mm films in standard or super 8, silent or sound, cartridge or reel-to-reel. Running times range from the shortest of single concept films to features, and the subjects from slapstick comedy to advanced science.

Lyons, M. Building a performance curriculum. San Francisco: Chandler Publishing Company, 1969.

The performance curriculum is a rather recent method of organizing an instructional program. The School of Education at Stanford University undertook, in 1965, a research project involving computerized school scheduling and vocational education. One phase of the project involved the establishment of performance curricula in a number of schools across the nation. At a series of conferences sponsored by Stanford, highschool teachers from these schools were given the opportunity to work with a number of prominent educators involved in various phases of implementing behavior oriented educational programs.

Mager, R.F. Developing vocational instruction. Palo Alto, California: Fearon Publishers, 1967.

A step-by-step guide to developing instruction in vocational and technical fields according to procedures developed in the research

laboratory and tested in the classroom, this book provides systematic bases on which to make decisions about what a course should contain in the way of content, depth of treatment selection of procedures, student evaluation, and course improvement. It contains numerous practical examples.

Moss, J. Review of research in vocational technical teacher education. Minnesota Research Coordination Unit in Occupational Education, University of Minnesota, Minneapolis, Minnesota, September 1967.

Every major division of education should periodically assess and synthesize the knowledge that has been accumulated through relevant research and development activities so as to make that knowledge more accessible and useful to practitioners and researchers. Such is the purpose of this review.

Moss, J. The evaluation of occupational education programs. Research Coordination Unit in Occupational Education, University of Minnesota, September 1968.

The paper treats the following eight dimensions of evaluation, plus a brief section dealing with some implications for action: (1) The importance of program evaluation; (2) some causes of past inactivity in evaluation; (3) a definition of program evaluation; (4) program outcomes (or evaluation criteria); (5) program characteristics; (6) two roles of program evaluation; (7) evaluation as a part of the educational change process; and (8) some research approaches to evaluation.

On using and being a consultant. Washington, D.C.: American Association of Junior Colleges, 1967.

This publication on consultative services is the result of a conference held in the fall of 1966 at Airlie House Conference Center in Warrenton, Virginia. Although the conference membership represented the allied health and medical education areas, it was soon decided that the discussions of the conference concerning using and being a consultant should focus upon guidelines for consultative services generally, without special emphasis directed to any particular cluster of disciplines. These guidelines then could be used as basic material for consulting services in any field.

Parker, J.C. & Rubin, L.J. Process as content: curriculum design and the application of knowledge. Chicago: Rand, McNally, 1966.

The authors advance the theory that process -- the way a given content is taught -- is crucial to effective learning. Consequently, they argue that any reorganization of the curriculum must concern itself with the methods used to accumulate categorize, analyze, and apply knowledge. Several formal and informal models for incorporating process into curriculum design are described.

Polos, N.C. The dynamics of team teaching. Dubuque, Iowa: Wm. C. Brown Co., 1965.

A fresh, concise picture of those team teaching projects which the author judges to be especially significant. This text is not a defense for team teaching but an attempt to come to grips with the many problems which team teaching raises. Dr. Polos' analysis portrays team teaching in its true light, as seen by educators actively engaged in the projects. It describes the theory and merits of team teaching, the structure, the national projects which are now underway, and the many pitfalls which should be avoided.

Program in Health Occupations Education, Division of Health Affairs, The University of Iowa. "Guidelines for an educational program to prepare pediatric office assistants." Iowa City, Iowa, 1969. (Mimeographed.)

This document is based on standards for pediatric office assistants established by the Committee on Manpower, Council of Pediatric Practice of the American Academy of Pediatrics. The format design has been utilized previously to develop guidelines for several types of educational programs. It is conceivable that, appropriately modified, it could serve as guidelines for any type of health occupations education program.

Raths, J., Pancella, J.R., and Van Ness, J.S. Studying teaching. Englewood Cliffs, N.J.: Prentice-Hall, 1967.

In assembling the fifty-eight essays comprising this innovative book, editors Raths, Pancella, and Van Ness have made two assumptions about the modern teaching process: that the better teachers in today's schools are the ones who are rational about the decisions they make in the teaching act, and "that although there are few generalizations about teaching that are firmly supported by evidence, there are practices and techniques current in teaching that have been deemed successful, if not on factual grounds, at least by the impressions of experience." The readings, ranging from a thoughtful appraisal of the nature of the teaching situation to testing and grading to discipline, focus on alternative methods by which teaching can be examined and described.

Riendeau, A.J. The role of the advisory committee in occupational education in the junior college. Washington, D.C.: American Association of Junior Colleges, 1967.

This publication is intended to serve as a guide for those who are charged with the responsibility for developing and maintaining occupational education programs at the junior college level. The chapters on function, organization, and administration of advisory

committees should be useful for all program directors. The suggestions for conducting fruitful meetings and for implementing committee recommendations should be especially helpful for the new director. The sample agenda, letters, minutes, and college advisory committee publications are intended to whet the appetite of the creative director.

Savel, O. and Belcher, H. An experience in basic nursing education. New York: G.P. Putnam's Sons, 1958.

Twelve assumptions regarding curriculum study which are included in this publication could be of assistance to curriculum planners.

Skaggs, K.G. A guide for health technology program planning. Washington, D.C.: American Association of Junior Colleges, 1967.

It was the search for a new educational resource to provide qualified technical assistance within health fields that led to the formation of an ad hoc committee composed of representatives of the American Association of Junior Colleges and the National Health Council. The guidelines reported herein constitute the report of the committee members. The Guide has as its focus the building of strong programs within two-year collegiate institutions through the collaboration of junior colleges with health practitioner associations and community health facilities.

Shumsky, A. In search of teaching style. New York: Appleton-Century-Crofts, 1968.

The author conceptualizes a climate of teaching in which the learning process itself becomes a creative experience. It emphasizes, in terms of the teaching art, the activation of the learner in the direction of intellectual growth. Designed as a basic text for courses in introduction to education, curriculum and student teaching, and for workshops on the disadvantaged learner, the volume promises another major breakthrough in the prospective and in-service teacher's goal to help the young learner realize his own highest potential.

Special issue on Program evaluation. Journal of industrial teacher education. 1969, 6 (3).

This issue of the Journal is devoted to the topic of program evaluation in education and particularly in vocational and technical education. It is roughly divided into two parts, the first contains a general treatment of evaluation, and the second part reports of specific studies which have produced data relevant to program evaluation.

Special issue on Vocational, technical, and practical arts education. Review of educational research. 1968, 38 (4).

Reports some of the major research and development contributions in vocational technical, and practical arts education completed since the October 1962 issue. Chapters: (1) Social and Philosophical Framework, (2) Manpower Supply and Demand, (3) Career Development, (4) Curriculum Development, (5) Techniques and Modes of Instruction, (6) Organization and Administration, (7) Staffing, (8) Program Evaluation, (9) The Past is Prologue.

Tuckman, B.W. The evaluation and testing of an evaluation model for vocational pilot programs - Final report. New Brunswick, New Jersey: Rutgers - The State University, 1967 (ED 016 083).

The evaluation of educational programs by the use of student testing based on specifically stated behavioral objectives was examined in this project. Of particular note is the review of literature which provides a rather complete annotated bibliography on the subject of program evaluation.

Weisgerber, R.A. Instructional process and media innovation. Chicago: Rand McNally, 1968.

Representative viewpoints concerned with the educational process and its development through new methods are presented. The material progresses from general to specific levels in the treatment of instructional process and media innovation. The book stresses the scope of change possible in instructional practice through wide use of media, and consolidates material on audio-visual methods to facilitate comparison of ideas.

Woodruff, A.D. Basic concepts of teaching. San Francisco: Chandler Publishing Company, 1961.

This book is one of the first tangible products of a six-year project in reorganization of a teacher education program. Its form and contents were developed to meet the specifications of the new programs. It is intended primarily to serve as a text for the first professional course for teachers at any level of education. Its mission is to give the prospective teacher a workable set of ideas of what a teacher does when he teaches a class. The teacher may use those ideas continually as a check on his work throughout his career.

# SUPPLEMENTARY MATERIALS

## Instructional Activities

Duane Anderson
The University of Iowa

I. Lecture-centered activities

- A. Films
- B. Slides
- C. Lecture by self or other
- D. Lecture by community leader
- E. Panel discussion by faculty members or community leaders
- F. Instructor recommends or requires attendance at a community lecture
- G. Instructor reads aloud in class high quality examination answers
- H. Instructor directly relates course content to other courses within the college
- I. Instructor presents case history material as part of a lecture
- J. Instructor gives information on, "How to Write a Report"
- K. Instructor discusses aids to study
- L. Students present lecture notes for inspection by the lecturer

II. Field Trips and Visitations

- A. Instructor visits another instructor's lecture, discussion session, or laboratory
- B. Instructor recommends or requires that students attend a movie, hear a radio program, or view a television program
- C. Field trips to a hospital, museum, school, social service agency, factory, etc.

III. Demonstrations

- A. Instructor or student conducts an experiment in class
- B. Instructor or student conducts a demonstration of human reactions
- C. Instructor or student uses artistic productions as teaching aids

IV. Testing and Other Evaluation Methods

- A. Students are given opportunity to write comments on tests regarding the clarity and fairness of test items
- B. Students are given opportunity to rate the instructor on a number of variables

C. Each student is invited to consult individually with instructor regarding the student's progress and evaluation of the course
D. Oral examination
E. Part of the student's grade is determined by his class participation
F. Students are given opportunity to determine the type of examination
G. Class time is used to review test results

V. Use of Extra-Classroom Resources

A. Students are asked to bring to class reports of personal experiences related to the subject matter
B. Students are required to interview an authority on a topic discussed in class
C. Students are required to integrate materials from other courses in writing examination answers or term papers
D. Students are required to bring to class material from current newspapers, magazines, etc.
E. Students are required to use technical periodicals in preparing reports, etc.

VI. Classroom Projects Involving Active Student Participation

A. Students hold panel discussion
B. Use of teaching machines
C. Essay contests
D. All students in class work on common project
E. Class time spent as a "study hall"
F. Students required to read aloud in class
G. Students present a dramatic presentation
H. Students are asked to criticize (orally or in writing) a quotation
I. Oral or written book review
J. Students are required to work problems on the blackboard
K. Students evaluate a case history (orally or in writing)
L. Students required to present extemporaneous speeches
M. Students engage in a formal debate
N. Class is divided into sub-groups for discussion
O. High-Scholarship students assist slow learners
P. Students ask each other questions in class discussion
Q. Students present oral or written reports on subjects assigned by instructor or chosen by the students
R. Students submit questions for lectures or class discussions
S. Students outline laboratory exercises

Seven Kinds of Committee Members---

Which Kind are YOU?

1. Some members are like wheelbarrows--no good unless pushed.

2. Some are like canoes--they need to be paddled.

3. Some are like kites--if you don't keep a string on them, they'll fly away.

4. Some are like footballs--you can't tell which way they'll bounce next.

5. Some are like trailers--no good unless pulled.

6. Some are like balloons--full of wind and likely to blow up unless handled carefully.

7. Some are one hundred per cent in interest, support, and willingness to work.

Which Kind are YOU?

- Author Unknown

## Sources of 2x2-Inch Slides for Health Occupations Education

Harwyn Medical Photographers
4814 Larchwood Avenue
Philadelphia, Pa. 19143

Medical and dental photomicrographs on hematology, histology, parasitology and tropical medicine, basic pathology, obstetrics and gynecology, and tumor microscopy. Slides sold singly and in sets. Free catalog. Descriptive material included with slides.

Clay-Adams
Division of Becton, Dickinson & Company
141 East 25th Street
New York, New York 10010

Anatomy, bacteriology, biology, cancer cytology, dermatology, heart and vascular diseases, hematology, mycology, nursing, opthalomology, pathology, pediatrics, tropical medicine, and urology. Color

slides, sold singly and in sets. Descriptive listings included with slides. Free catalog available to the professions only. Please submit request on official stationery, indicating title and field of interest.

Publications Section, CIBA
Summit, New Jersey 07901

Color reproductions from Dr. Frank H. Netter's paintings of normal and pathologic anatomy. Approximately 1400 subjects available in slides in cardboard mounts, sold individually or in complete sets. Listing available. Partial list includes: nervous system, reproductive system, upper digestive tract, lower digestive tract, liver, biliary tract and pancreas, endocrine system and selected metabolic diseases, and a large selection from clinical symposia.

Denoyer-Geppert Company
5235 Ravenswood Avenue
Chicago, Illinois 60640

Human anatomy, physiology, histology, parasitology, zoology, gynecology, obstetrics, serology, bacteriology. New sets on elementary and advanced sex education. Slides sold singly and in sets. Free catalog available.

General Biological Supply House, Inc.
8200 S. Hoyne Avenue
Chicago, Illinois 60620

Medical and dental photomicrographs on human and mammalian histology, human tissues, animal histology, protozoa parasitology, and human pathology. Slides sold singly and in sets. Free catalog available to biology teachers.

## Sources of Film Loops
## For Health Occupations Education

J.B. Lippincott Company
East Washington Square
Philadelphia, Pa. 19105

Seventeen separate film loops in fundamentals of nursing are included in four series: bedmaking (3), hygiene (3), positioning and exercise (2), and injection technic (9). Each series includes a comprehensive Instructor's Guide plus a Student Guide firmly affixed to each film loop cartridge case. Detailed film loop catalog sent upon request.

McGraw-Hill Book Company
330 West 42nd Street
New York, N.Y. 10036

Thirty-four film loops contained in a fundamental nursing series of seven study units: sanitation (2), basic unit procedures (5), utility room procedures (5), body mechanics applied to nursing (9), hospital safety procedures (6), food service procedures (4), and geriatric procedures (3). Study guides are available to accompany each unit. The Fundamental Nursing Services are also available in standard 16mm color film.

The Ealing Corporation
2225 Massachusetts Avenue
Cambridge, Massachusetts 02140

Available is a six loop set on the subject of human reproduction and birth. Adapted from an internationally acclaimed film made in Sweden by Lennart Nilsson, whose unique photographs of human embryos were the basis of the famous article on human birth published by Life magazine (April 30, 1965).

Comprenetics Inc.
1601 Rambla Pacifico
Malibu, Cal. 90265

The Comprenetics System is designed to help hospitals train new employees and provide reviewing and up-dating of procedures to existing personnel for better efficiency. The series of 212 film loops provides a solid background in the techniques of basic patient care, principles of hygienic housekeeping, and up-to-date maintenance methods. Films have potential for many different applications within the health occupations.

Scope Productions, Inc.
1461 West Shaw Avenue
Fresno, Cal. 93705

One film loop is listed on the subject of nursing.

Potter's Photographic Applications Co.
160 Herricks Road
Mineola, L.I., New York

Seven titles are available dealing with selected nursing education subjects: sterile glove technique, skin preparation for delivery, principles of infant feeding, medical asepsis putting on a previously-worn gown, preparation of foley catheter tray, cobalt-60 therapy, and a malformation of the heart-blue disease.

Film Associates
11559 Santa Monica Boulevard
Los Angeles, California 90025

Seven film loops concerning the following nursing functions: pre and post injection, intravenous injection, intramuscular injection, subcutaneous injection, intradermal injection, gastrostomy feeding, and female catheterization.

For additional sources refer to: Kone G.A. (Ed.) 8mm Film Directory, 1969-70. Educational Film Library Association, Inc., 1969.

## CURRICULUM PLANNING

Lawrence Borosage[1]

During the short period of time that we have to devote to curriculum planning in this Institute, I would like to present two major points. First, some additional social forces other than those mentioned by Dr. Stern will be treated. Secondly, some new considerations in curriculum planning that the technological ambience demands.

In addressing ourselves to the first, it is becoming increasingly evident that our society is moving agonizingly toward the principle of inclusion and away from the principle of exclusion which has dominated our thinking in the past. One witnesses this in employment, education, black capitalism and a host of other activities. To some this means I want a piece of the action; to others, let's allow all to participate in the mainstream of life. To those of us in the field of vocational technical education this has been made abundantly clear in the Amendments of 1968 which shout out that no individual should be excluded from having the right and opportunity to obtain the kind of vocational education he or she desires.

There is another dimension to this principle of inclusion rather than exclusion and that is in the realm of decision making. This is the dimension that may prove to be the most potent determinant of our behavior regarding curriculum policy. One needs only to scan the contemporary social scene to sense the restiveness of different sectors of the population. More recently we have sensed this disquietude

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[1]Dr. Borosage is, Professor, Secondary Education and Curriculum, College of Education, Michigan State University.

invade the helping professions. Who would have ever thought that our military would have spotty incidence of rebellion? Certainly the religious institutions are breaking out at the seams against blind obedience from above. The teaching profession has seen fit to march to a different drum beat. The dedicated nursing profession has checkered its missionary zeal with work stoppages, strikes and bargaining not only for the sole purpose of improving financial reward but also to better other aspects of work life as well. In the June issue of Nursing Outlook, the editorial has something to say to us:

> "We have to learn that students and patients have the right to make decisions that affect them." At another point the writer continues, "If we do not involve the consumer from all groups, the same thing that is happening in our educational system will happen in medical service."

I am fearful that this individual seems to view upheavel as outside of the immediate ken. I wonder if he is aware that medical service is in difficulty already. I will elaborate on this at a later point in this presentation.

Back in 1967, I recall reading an article written by a psychologist who said that innovations that would affect education would be routed in two forces. One he called the invasion from without; the other rebellion from within. It is patently observable that one wave of external invasion as reflected in the technological revolution in education has taken place. The systems approach to instructional planning; and instructional strategies involving a host of hard and software are demonstrable manifestations of this revolution. It concerns me no end when one sees some of the projections made for the near future. Major American business firms are moving into the great new people industries and entertainment. This shift is significant for both public and private educational systems as they will have to furnish the manpower. The human service industries are already big business. Over 150 major American firms have moved into the educational business. They are inventing, producing and selling more sophisticated, effective devices for teaching that will inevitably transform education. Their plan is to service education, but soon they may try to replace the present educational system with another system.

Viewing this from another aspect, I have had the opportunity to work with one of our largest corporations in the United States in which they are very much interested in forming what is known as "partnerships with education." At present some sixty high schools and school systems have formed such an alliance. The undergirding tenet is that the corporations have certain know-how and, it is their contention, they can improve education of youth by working together with the schools. I agree. An illustration may clarify the point.

One corporation is concerned about the problem they encounter when they hire high school graduates. Their research shows conclusively that high school diploma carrying graduates are unable to read at the eighth grade level. Since much of their training is based on programmed learning which calls for the reading ability prerequisite, they have found it necessary to establish remedial education programs. So you have the incredible phenomenon of a high school graduate who after initial employment must undergo remediation in the basic tool skills. As a corporation they pay somewhere in the neighborhood of one-half billion dollars in school taxes. It seems inconceivable to them that they have to be saddled with a remedial education program for new high school graduate hires. Their contention is that they don't mind providing remedial education but if they have refined the technique why can't the schools adopt them?

Another category of technological revolution is more social in nature. This is the utilization of the systems approach and the application of common sense analysis to school activities. In addition the burgeoning popularity of the T-group, sensitivity training group and human relations training have emphasized a social technology somewhat different than the past. The research laboratory has contributed the simulation exercise or the educational game. These are just a few of the developments which we see as a result of this invasion from the outside which are having an impact on the formulation of educational thought and policy.

Let me now turn for a moment to the second force, rebellion from within. When we refer to student characteristics it is imperative that we recognize <u>that they want to help make the decisions that affect their destiny</u>. In the past we have utilized various measures to determine achievement, intelligence, aptitude, physical fitness, however, our appraisals did not include any consideration of involvement in the decision-making process. One hears the plea for relevance. In the August 16th issue of Saturday Review an article entitled "Medical Students: Healers Become Activitists" presents some convincing arguments by a student in training. He says, for example,

> "yet medical student activism is a fact. It is new and somewhat limited but it is real. Students have begun to resent their roles as automatons and have begun to question the models and methods of their profession and abandoned passivity for immediate social action.

In another portion of the article he continues:

> "the changes have been of two kinds--those directed at the curriculum and those aimed at interaction between the medical school, its students and community."

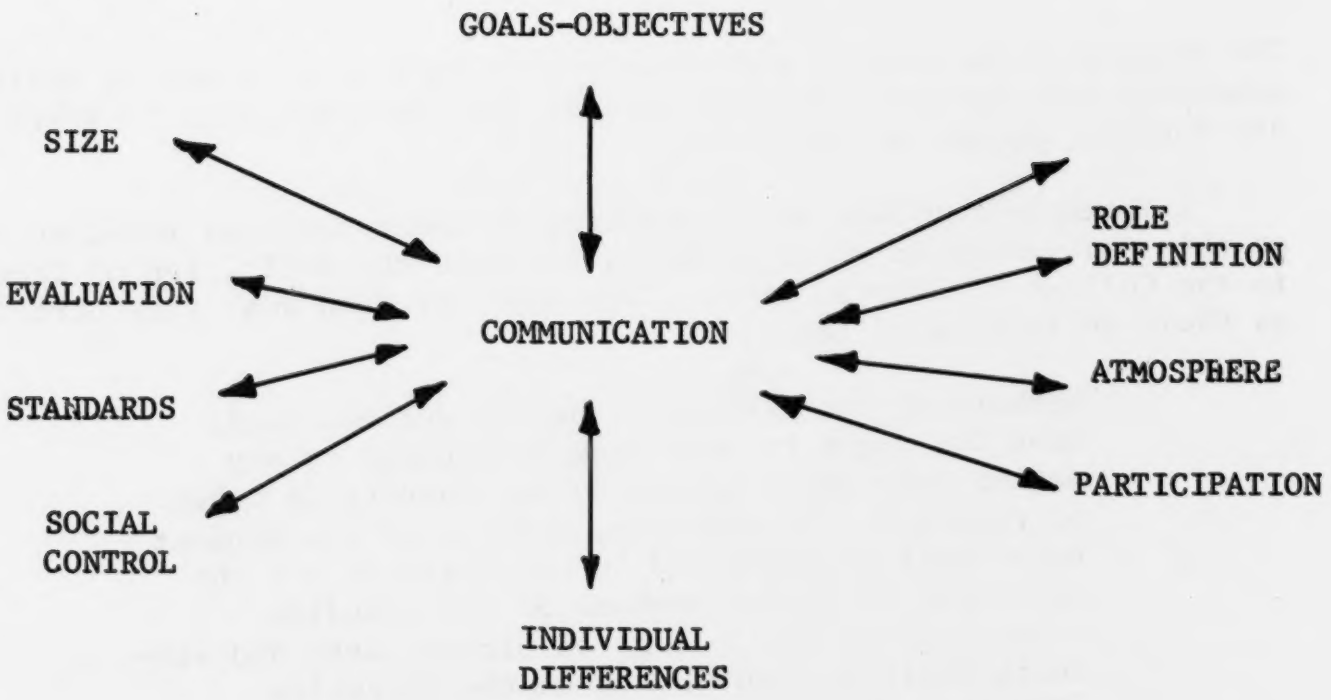
The article cites some of the changes that have taken place in medical education and the position that medical students will take to institute and execute change in the future.

I recently reviewed an interesting document that was released here at this University in which students reviewed the definition of faculty in the College of Liberal Arts. They also set down what they perceive as their definition of faculty.

> "Members of the faculty as herein defined shall have the right to vote upon or consent to any matter upon which action by the faculty is taken or required. In addition, members of the student body shall be appointed to one-third of all the positions as voting members of the standing committees of the College of Liberal Arts and students shall be represented on the Executive Committee of the College of Liberal Arts in the persons of Student Body President, President of Graduate Assistants and chief officers of all students in the College of Liberal Arts."

In addition are listed seven additional ways in which students perceive themselves as part of the faculty.

Given these forces and those previously mentioned by Dr. Stern, curriculum planning is increasingly going to call for a more careful consideration of relationships and the utilization of more effective communication skills. Communication does not exist in a vacuum but deals with a set of relationships. It is impossible for me within the time limits to discuss in detail a conceptual framework but I will present an overview. I would submit there are a network of sensitivities that the curriculum planner must be aware of as he goes about his task. This can be presented schematically utilizing the model on the following page:




It is becoming evident that it is virtually impossible for any given occupational area to develop a curriculum in isolation from students, other faculty and the consumer of the product. For example, if one component of the total curriculum is general education then a relationship with other disciplines is mandated. Determination of each of the sensitives above becomes a shared activity which can only be accomplished through communication strategy. Since we have already discussed various dimensions to curriculum planning in this Institute and I am sure further reference will be made to it as we deal with the various modules, permit me to give illustrations or make some short comments about the sensitivities.

Goals and Objectives: Dr. Tomlinson and Dr. Stern spent substantial time in discussing objectives from the standpoint of generality as well as specificity. I would argue that any goal-setting

or determination of objectives must take into consideration the student concern as well as the labor market concern. These do not necessarily constitute a neat, tidy fit. In the past because the labor market has dictated to us we have lost sight of some of our students and hence they were excluded from our thinking. The emerging emphasis on the ladder and lattice concept to enable students either vertical or horizontal mobility lay stress on different objectives than our conventional behaviors has demonstrated in the past.

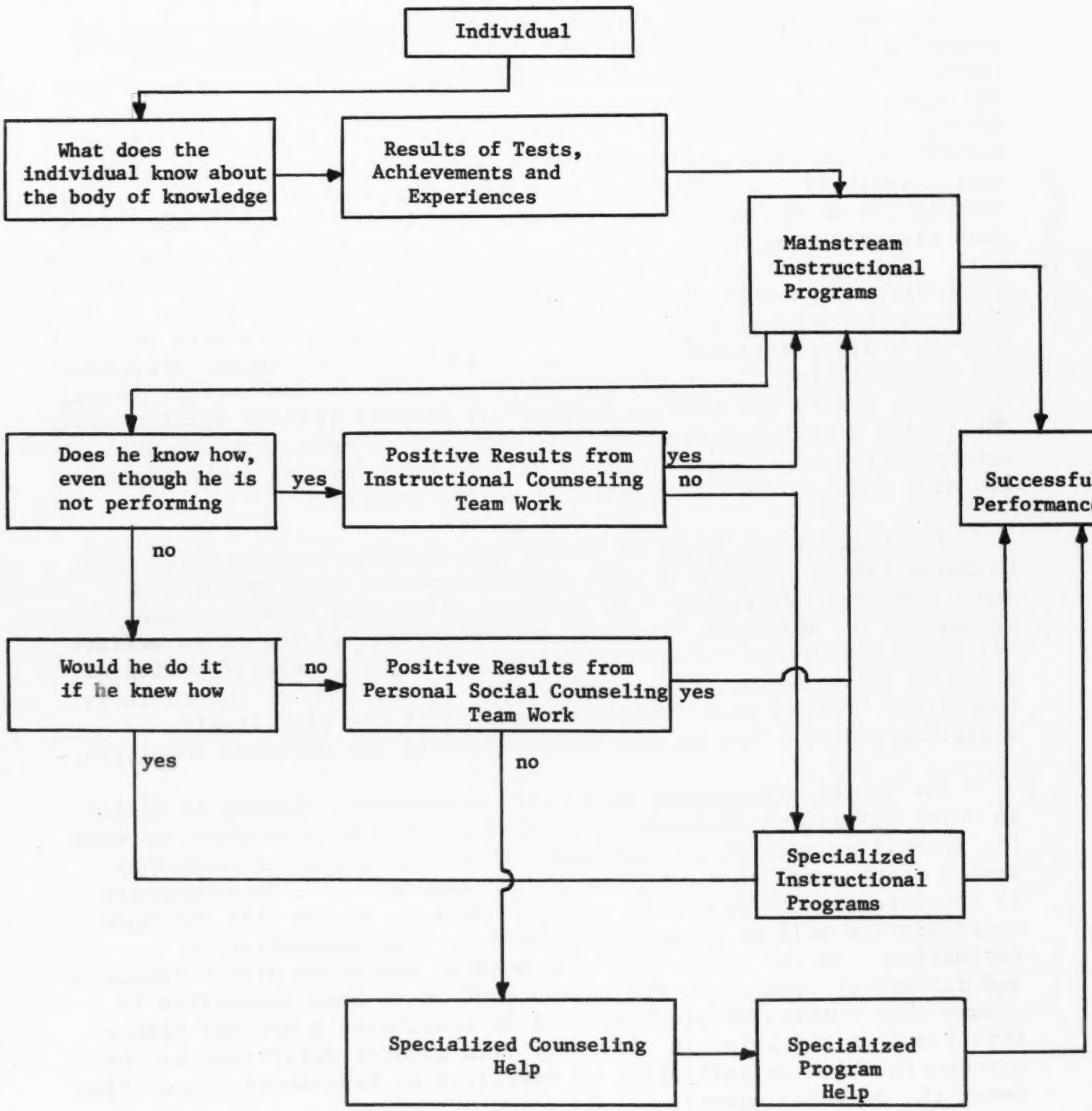
A second aspect in the model concerns itself with the means for achieving the goals and objectives we have established for our curriculum. With the clamor for open-admissions policy becoming more strident, it behooves us to think in terms of achieving ultimate goals through a variety of routes. Olsen presents a formulation, although focused on the handicapped, which has some application to all students particularly if the open-admissions policy becomes widespread. In his formulation as we see student-centered curriculum planning based upon four elements evaluation, personal social characteristics, program and goal. Although it is safe to say that the majority of students in any given curriculum will be able to move through the three phases as the chart on the following page illustrates, there will be others who will require a differentiated curriculum based upon their needs, attitudes and achievements. These alternative routes are so indicated. As we gravitate toward the systems approach it becomes readily apparent that curriculum planning must place more emphasis on more sophisticated determination of student input as well as more careful analysis of learning tasks to be made available to the student.

The third sensitivity in curriculum planning is role definition. Decision making includes a host of functionaries each having some input into the curriculum; the consumer, licensing agency, state department of education, faculty, and students. If one is to mediate all these influences of various groups, it suggests clarification of roles in the process. For example, what is the role of the advisory committee? Unless this is clearly defined it may find itself dictating policy which is not the function of the advisory committee.

The fourth sensitivity deals with atmosphere, climate or milieu in which curriculum planning is to take place. By atmosphere we mean the prevailing mood or feeling among those who engage in decision-making about curriculum building or improvement. If the atmosphere is characterized by apathy it is reasonable to assume that not much consideration will be given to innovation, experimentation or evaluation. On the other hand if a mood of wholesome dissatisfaction and discontent undergirds the environment it is also reasonable to assume that curriculum planning will be considered a process rather than fixed at any point in time. Of even greater deterrence is the atmosphere which is indicative of hostility or high-level competition among the decision-makers.

## A Flexible Comprehensive System for Changing Behavior*

Evaluation | Personal-Social Dimensions | Program | Goal




*Olsen, Assistant Superintendent, Pittsburgh Public Schools.

The fifth sensitivity identified as participation called for intelligent involvement of various interested parties. By intelligent involvement we mean the mental and emotional contribution rather than the mere physical bringing together of individuals. It would appear that this would then call for some prerequisites such as the following:

1. There must be adequate time to participate.

2. The participants must be able to communicate with each other.

3. The participants must have the ability and knowledge to engage effectively in the decision-making process

4. Those involved must not be threatened by each other. Participation thrives best in a climate of freedom.

The sixth sensitivity, individual differences not only deals with student characteristics but individual differences in faculty and consumer concerns. Frequently great expenditure of time, effort and energy results in faculty members "doing their own thing" once the classroom door is closed. The pursuit of private goals take precedence over group goals largely because the individual differences of the faculty have not been considered. The end result is the hidden curriculum. Employer expectations may be unrealistic in the sense that they expect a finished product that will meet the peculiarities of their specific situation. Yet the curriculum may call for some commonalities that have applicability to most situations. It may be impossible to deal with all of the individual differences represented by the employers.

The seventh sensitivity, social control is the pressure exerted by the group to obtain conformity from the individual or a sub-group within the total. This can best be illustrated by unrealistic licensure, certification requirements, legal sanctions or past practice. The controversy over the ladder and lattice concepts as against traditional curricula is a case in point.

The remaining sensitivities such as evaluation, communication and standards will be discussed at a later point in the Institute so we will forego them at the present time.

In summary, what I have tried to say is that the future will call for a more sophisticated approach to curriculum planning in which we will have to develop our communication skills to deal with students, faculty, employers and other interested groups in a more meaningful manner than in the past. We can anticipate that controversial issues will arise but hopefully we will be able to resolve these to dialogue and debate that will result in more carefully designed curricula in health occupations.

# INSTRUCTIONAL STRATEGIES

## Institute Staff[1]

Duane Anderson: No matter what type of teaching strategy you chose to use a fundamental step to learning is that the learner must clearly perceive the referent. He must be able to visualize the object or concept, and you must evaluate the technique you use based upon its ability to assist him to perceive the referent. Let's say you are teaching the concept of blood pressure. This concept of blood pressure needs to be indelibly printed on the students' minds. They must see what it is you're getting at. I've never taught blood pressure and I don't know what a sphygmomanometer is, but I have taught air pressure in science classes. I used to spend a great deal of time trying to convince students that there is 14.7 pounds of pressure bearing down on a square inch of their hand. I tried many ways to describe this to them, but they couldn't seem to understand it. They couldn't visualize it. So finally I took a tin can, boiled a little water in it, screwed the cap down tight, set it over on the table and just stood there. Pretty soon the can started to crunch - crunch and it collapsed on the table. Everyone in the room suddenly said, "aha." They perceived the concept. Too often we expect students to learn concepts vicariously. You people are generally in a pretty good position in teaching the health occupations for often times you can actually have students see what you're talking about in a clinical setting.

A second step in teaching is clarifying, discussing, developing, and memorizing the various aspects of that particular concept. Even though we don't like the idea of memorization, if the doctor says, "Put the bandage on the femur or humerus," I want to make sure I get it on either the arm or the leg. They need to know certain things, so memorization is important.

Then a third step is to provide an opportunity for the learners to try out the concepts in real life situations. Your teaching methods are psychologically correct if they accomplish these three steps.

Lawrence Borosage: In looking at this whole question of the teaching process we are also talking about the communication process. We were talking about the fact that here is an instructor who may have certain kinds of information and here is a student over here who has a mental set and who has to receive this information to be rewarded. Now between these two people there is a kind of transaction that has to take place. I'm going to go through this rather rapidly. I don't choose to do it this way but I guess we're going to have to in the interest of time.

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[1]Several members of the H.O.E. Teacher Education Institute participated in this session.

I think we have to have a definition of terms. The communication process to me means a process in which understanding takes place between a source that originates information and a receiver who wishes to get the information. It's a process of understanding. Now, in this process a variety of things begin to happen. You see I'm a human being, and as I stand before you right now I'm not going to talk just about only your needs. I've got some needs too. For example a student suddenly says, "Eureka - I've got it!" It's not only the student who gets satisfaction, but I am also satisfied.

When I talk about the communication process, I'm really talking about four ingredients. Source, message, channel and receiver are all parts of this process. When things don't happen as we would like them to happen the normal thing is to point the finger at the students. "I just can't understand why these students don't understand what I'm trying to tell them. I guess it must be that the book I've got now isn't as good as the one I had last year." When communication doesn't take place we have a tendency to project this on to the receiver. I'd like to take just a moment here to look at some kinds of things that get in the way from the standpoint of the person who is the source, or the teacher. We will use the SMCR Model shown on the next page. Both the instructors and learners individually and collectively come from different social cultural contexts. That's exactly what happened in this institute. As a staff we sat down and planned what we thought should be covered and in what way, but all of you didn't have the same background so what we have planned, doesn't necessarily exactly fit the kind of background that you people brought to the institute. When I talk about social cultural context in the source and in the receiver there's a value system that's at work, there is a set of perceptions that are at work, there is a set of feelings that are at work. There is a background of many types of experiences that I bring to this situation that may be a little bit different then the background of the learner. So the first thing that gets in the way of communications is a difference in the social cultural context between the teacher and the student.

The second barrier that may get in the way is knowledge. Knowledge in the sense that here I am the source. I have spent a great deal of time studying, doing research, accumulating a great deal of information and knowledge and yet I may assume that the receiver has more previous knowledge then he actually has. The other thing that I may do is to underestimate the amount of knowledge that the individual has. I may be assuming that I am doing a very good job of instruction when in reality everyone is bored. What I'm saying, in part is, that you have to know who the receiver is, individually or collectively.

| S | M | C | R |
|---|---|---|---|
| SOURCE | MESSAGE | CHANNEL | RECEIVER |
| Comm. Skills | Elements | Seeing | Comm. Skills |
| Attitudes | Structure | Hearing | Attitudes |
| Knowledge | Content | Touching | Knowledge |
| Soc. System | Treatment | Smelling | Soc. System |
| Culture | Code | Tasting | Culture |



* D. Berlo, The Process of Communication, (1960) Holt, Rinehart and Winston, Chapter II.

A third kind of barrier that may get in the way as the source and the receiver interacting in a communications situation is attitude. You can readily see how the feelings the source has for the receiver can affect communications. Think of having to work with the hard core unemployed when you're uncomfortable with them, or having to always work with older people when they get on your nerves. This can be extended to many different kinds of attitudes.

I haven't said anything yet about communication skills which is the bag of tricks. I have talked about some kinds of characteristics of the instructor which gets me to the point where I want to say that every individual has a "personal idiom." To me there is no such thing as a teaching personality. I don't know if in medical technology, or in nursing whether you have carved out for yourselves a nice tidy image so that you can say this is the nursing personality and this is the medical technologist personality, but I doubt it. Likewise, I don't believe you can come up with a teaching personality. I say this in direct contradiction to what was mentioned here the other day by Mike Masucci when he said you should set up models. I believe that within this kind of arrangement each one of us has some decision making to do. As a teacher what works best for me? You've been in many situations, and so have I, where some individual got you so deeply involved in a lecture that when you went to leave the room you were completely exhausted. You were really involved in what that individual had to say. Take that same individual and ask him to carry on a discussion and maybe he can't do it. It's not his bill of goods.

You have had demonstrated from the front of this room here this very thing that I am talking about. You have seen some very different personal idioms at work. You have had presentations made by individuals who have started out in a very orderly manner. They ordered everything 1 - 2 - 3 and 4. You had a demonstration also of an individual who used what I would call the unstructured exploratory system of teaching in Mike Masucci. You can't get Mike to do the kind of thing that Jake Stern did. He won't come. You tell him you want him to put on a lecture and Mike is not going to come. What's the first thing he said to us? "I don't know what we're going to do." So in a completely unstructured manner he says, "The best way that I can operate as the teacher is to start with your needs." And so he begins with a problem census to discover what your problems are, and on the basis of those problems he goes ahead and comes out with what works best for him. You had an experience with orderly instruction in the presentations by Jake Stern. Very orderly! This is what I mean by the personal idiom. The thing that I would say is that it is terribly dangerous to try and force a set of techniques on people and say that the discussion method is much better than the lecture method or vice versa. I can only say, "It depends." It depends on who it is. It depends on the way in which the individual looks at the world.

Let's look now at two other aspects of this in the last dimension here, that of communication skills. Communication skills are dependent on some of these other kinds of attitudes. Now, for example what is my attitude toward myself? If my world view and the way I look at people is such that I'm an authoritarian, then the way in which I'm going to communicate will reflect this personality structure. There are four major categories of leadership types. This is not educational research but it is research from social psychology by Lippet et. al. The four major categories they have identified are called: (1) bureaucratic-regulative, (2) autocratic-directive, (3) indiocratic-manipulative, and (4) domocratic-integrative. To satisfy my needs as a teacher, I can do the most beautiful job of manipulating students. I need this. I can carry on what I call directed discussion and can manipulate students through a system of tricks and get them to accept what I had in my mind all along. I know the skills, this fits my world views, I manipulate people.

You can see on the chart on the next page that individuals having different leadership types have different leadership attitudes. Let's look at some samples of how people in each one of these frames of reference behave. First we'll look at the objectives of teaching under each of these four frames of reference. The individuals classed as bureaucratic-regulative develop a system and they do what the system says. Many individuals who find themselves in bureaucratic structures say they can't do certain kinds of things because the system won't let them. They never see themselves as part of that system. It's as if the system developed by itself and is now telling them what they should do, but in reality, they are the system. The autocratic-directive individual develops himself. He doesn't develop the system, he's concerned about himself. The indiocratic-manipulative leader develops the individual so he can use them. The individual who is a democratic-integrative leader develops the group, but the individual within that group.

Now, let's take another point of view. Where do the sources of authority come from? In the first case the bureaucratic-regulative authority comes from the rules. The rule book gets bigger and bigger. Authority stems from the rules that are set down. With the autocratic-directive, the rules stem from himself. He's the individual who makes the rules. In the manipulative, in many cases, the rules may stem from the leader but because in many cases he may manipulate the individuals to his advantage they may seem to come from the group. He doesn't tell them, but maneuvers the situation around to where the individuals think that they came up with the rule. In the last category it's the group that comes up with the sources of authority.

## Leadership Types and Characteristics*

| LEADERSHIP ATTITUDES | BUREAUCRATIC-REGULATIVE "Dependent" | AUTOCRATIC-DIRECTIVE "Driver" | INDIOCRATIC-MANIPULATIVE "Diplomat" | DEMOCRATIC-INTEGRATIVE "Quarterback" |
|---|---|---|---|---|
| 1. Frame of Reference | "T[illegible]" | "I" | "You" | "We" |
| 2. Orientation | Rule-centered | Self-centered | Individual-centered | Group-centered |
| 3. Motivation | Personal Security | Power & prestige | Personal recognition | Recognition self & group |
| 4. Objectives | Develop a system | Develop self | Develop individual | Develop group |
| 5. Controls Used | Formal | Technical | Psychological | Social |
| 6. Source of Authority | Rules | Self | Individual | Group |
| 7. Concept of Learning | Trial and error | Repetition | Rewards & punishments | Ego-involvement |
| 8. Demands on Learner | Loyalty | Obedience | Ambition | Cooperation |
| 9. Contact with Learner | Infrequent and personal | Detailed and critical | Informal | Informal, close and frequent |
| 10. Communication with Learner | Avoids | One-way | Superficial two-way | Sincere two-way |
| 11. Learner Identification | None | Negative | Learner self interest | Leader and overall goals |
| 12. Learner Relationship | Official | Authoritarian | Manipulative | Integrative |
| 13. Learner Morale | Apathy | Antagonism | Competition | Teamwork |

*From Robert K. Burns, Management and Executive Development in the U.S., International Management Congress, Sao Paulo, Brazil, 1954.

Since we are talking about communication, let's look at communication and the leadership types. The individual who fits into the category of bureaucratic-regulative avoids communication. He tries to stay away. With the individual who is the autocratic-directive type communication is one-way. This is the instructor who comes in, starts talking, goes on and on and on, and at the end of the hour he picks up his material and that's it. When it comes time for an examination, he may turn this over to a graduate assistant. He cannot be bothered with the minutia of two-way discussion. Now, the manipulator, his communication is two-way, but superficial. You don't really stand a chance. In the last category, the democratic-integrative it's a sincere two-way communication.

As I now start thinking about how I'm going to communicate with my students, one of the things I must do is to develop a message in terms of this teaching episode that is going to take place. There are three major aspects to the notion of the message. One, you have to have content. The next thing one has to think about is how are you going to code it. I remember when I initially worked with some practical nurse programs, I sat in on classes with registered nurses teaching practical nurses. If you don't think that you have a jargon, wow! The way this registered nurse had coded her messages was such that some of those students were lost. It happened this morning. Someone said something about T & I teacher educators which wasn't understood by all. When there are terms that are used which you don't understand I hope that you will continue to challenge us; let's get at them the same way that we did this morning. This is certainly one way to improve communications. I hope that there will be this kind of a climate in the situation in which you find yourself with those individuals that you are going to be training as teachers; that they too might have this kind of freedom. Now, what I'm talking about when I say you've got to code your message is that you've got to code it at the level of the student. It is very easy to use language at a level that may not be consistent with the learner.

The third aspect to this notion of getting the message across is the matter of how you are going to handle the content in terms of what kind of treatment you are going to give it. Here is where the personal idiom comes in. One individual says, "I'm most effective if I lecture." So lecture! Another individual says, "This is not my strength, it seems to me that I have a greater impact if I engage in group discussion." So lead group discussion! Now, I have taken the content and I have included in the message, in part, the treatment that I am going to give it.

Having done the preceeding, I take a look at the channels. There are several ways that we can order channels. There are some people who order it in terms of mass media, small groups, person to person, etc. I don't see it that way. My system of ordering follows pretty

much the idea of how people receive information. We receive information basically through the five senses. Given that I have decided on the content, how I'm going to code this learning episode and the treatment that I am going to use, what do I do now in order to reach the individual? The person who decides to use the lecture method is saying, in so many words, that he is going to use one sensory receptor--the sense of hearing. Another individual may combine the sense of hearing with the sense of seeing. Now, the minute that you say you are going to combine two of these senses you get into what Duane Anderson mentioned when he said, "What kinds of instructional media am I going to use?" You now have to do some additional planning. In some cases, I might say to myself, well, I will use the sense of hearing, seeing, and touching. A demonstration in making a bed; hearing, seeing, touching. I involve three of the sensory receptors. The advertisers have certainly learned this lesson. They know more about the application of learning principles than the educator themselves. Have you seen magazine advertisements that do this? An example is the Nescafe advertisement where they staple a little package to the page. I can see it, I can touch it, I can taste it, and I can smell it.

Teaching is a communication process in which you are introducing your personality. I don't think that there is anything more tragic than an individual who has been told that in order to get your class with you, you've got to tell them a story; but the individual can't tell stories. He can destroy relationships rather than improve them by trying to play a role that doesn't fit him. What I am saying is, lead from your strength. Don't try to develop a model, or step into a model, that isn't you.

Teaching is a process and the techniques or the methodology that you use are dependent upon the content that you are going to be teaching, the learner that you are attempting to reach, and upon the social climate in which you find yourself with these students. It isn't a very good idea to have a discussion on morale when the students are out on strike. The climate in which we find ourselves at a particular time can have a great deal to do with what I may decide to do as an individual who is going to establish a teaching episode.

Anderson: Recently there has been considerable talk, and some action, regarding the use of the audio-tutorial approach to education. As an input to your thinking on this topic I would like you to view a film entitled "New Paths to Learning." This film is about the Oakland Community College, Bloomfield Hills, Michigan. It depicts an institution which has used the systems analysis technique to develop programs and curricular materials. They use the audio-tutorial approach in both academic and vocational-technical programs.

(Note: At this point the film "New Paths to Learning" was shown. This film is available from Litton Industries, Inc., Broadcast Motion Picture Services, 336 North Foothill Road, Beverly Hills, California, 90213.)

I suppose the only strong negative reaction we have seen regarding this film, and the use of the audio-tutorial method as shown, is with regard to the extent of dependence being placed on a single strategy. Some have been concerned as to whether student motivation can be maintained without more student-teacher contact. It's probably like a lot of things; good for what it is designed for and for appropriate topics or subjects, but not a panacia.

Jacob Stern: The question has arisen as to whether students should be paid for the time they spend in the work experience situation. You'll have to admit that if you do pay them the reward system is closer to the reality of the external work situation. But by the same token if we pay the student we are emphasizing or underscoring extrinsic rewards and de-emphasizing intrinsic rewards. We must keep this in mind when we make the decision, to pay or not to pay the student for his work experience. Now, let's say that one school is persistent for a period of time in sending students out on a non-paying basis while another school in the same area is persistent in sending them out such that they are paid for their work experience. You are going to get different kinds of clustering; the students are going to self-select. Those students who are motivated to the health occupations education area for intrinsic reasons are more likely to gravitate in the direction where they are not being paid for the work experience, and those who are motivated primarily by extrinsic rewards will probably identify themselves with the other school. I'm not saying which approach we should use, only that we should look at the alternatives in light of what results they may have.

There is another point I would like to make. I call it the paradox of the example. It pertains directly to educational methodology. There is an ancient proverb that says, "For example is no proof." Because our fields are so closely allied to the practical world we tend to gravitate natually to laboratory activities, to doing things. I think there has to be an ameliorating point made regarding the examples we use. If you show a student something as being a representative example of the real world out there, the student zooms in on that example and in his own mind he says, "This thing he shows me must be the outside world." That places a tremendous responsibility on us for selecting the examples that we will show. So, I want to make this point, that we can distort their concept of reality by our examples. You see, that's the danger. It's a paradox. What I mean by a paradox is that you can't get away from it in a sense. You must provide examples and I'm not asking you not to provide examples, but I'm

saying that there is a risk and a danger involved. The strategic questions are: Which examples shall I provide? How shall I distort reality? By what distortion will I do the least damage?

Anderson: There is one thing that has bothered me in anticipating your returning home to teach others how to teach. It is analogous to the doctor's example earlier of taking an auto mechanic and in six months training him to remove stomachs. If you recall the difficult problem was knowing when to remove the stomach. I'm sure this relates to the real crux of the matter in talking about techniques. All of you could pick up a simple book on teaching and get the rules on how to carry on a discussion, how to conduct role playing and the various other techniques. The thing that you're really going to have to struggle with is helping the new teacher to select the proper technique. I think that this is a pretty difficult thing to do.

We have to begin with the kind of questioning we did yesterday. What kind of techniques do health occupations teachers use now? Which methods should we be encouraging them to use and what kind of help should we be giving them to assist in the selection of the best techniques? This is where you've got to impress upon them the importance of their objectives. They must look at their objectives in order to determine what technique is psychologically best. It is also important for them to look at the student because they can't accurately determine which technique they should use until they have an image in their minds of the kinds of people, the receivers, that are out in front.

This past year I had the opportunity to visit many vocational education classes. This was part of a state-wide evaluation of our new merged area schools in Iowa. We had quite a session on whether or not people at the University ought to be looking at vocational schools, but eventually it was decided we should. At noon today I made the statement, and you all might jump on me as Jake and Larry did, when I say that there is a great deal of stero-type, steril teaching going on in the vocational classes. There were the teachers in new, exciting and innovative fields with all kinds of opportunities and yet I found them using very traditional approaches to teaching. I realize that many college teachers, and maybe a lot of teachers across the board do this, but we ought to do better. With these newly merging programs we're in a position where we can innovate. There are certainly opportunities to explore new and exciting techniques of teaching.

One of the big problems with the whole area is that you can't really talk about techniques in isolation. It's an impossibility to teach, or to talk technique, as an abstraction. You must get down to specific factors; you've got to hook the student, the objectives and the content together. I use the example often that you can't

successfully take a correspondence course in swimming. It just doesn't work. This is the big problem with methods courses at universities. They try to teach people to teach out of context.

Stern: I have been stimulated by this business of typologies of personal idiom that Larry discussed with you. I don't want to detract anything from the utility of the typing of personal idioms. I'll start with that. I'm reminded of a poem by T.S. Elliot where the speaker says, "When I am pinned and wriggling on the wall." What he means is that when everybody, including myself, has pegged me for something - x, y, or z - then something is missing - something's lost. When you get that tightly pegged for something, whether it be a lecturer or whatever, then something's lost. "I know him he's the one who lectures, he's good at lecturing." "I know him he's great at the informal seminar kind of thing."

I think that maybe we should bear in mind the possibility that each of us could be good at all of these things, given certain settings. Possibly each of us can function well in a number of different contexts, using personal idioms. I think that we ought to bear this in mind as we seek out our own personal idiom(s). In one substantive area I may perform most successfully in an interactive type of idiom. I think that we need to try out the different idioms in different contexts to find out what battery of techniques we can use best.

Robert Tomlinson: My reactions and comments concerning strategies at this point are concerned with some principles, often times mentioned but sometimes not really understood, and notes made during prior sessions and discussions. Some have particular advantages for instructors in the health occupations. Some are interrelated but let me list them in order for purposes of clarity.

(Meaningfulness) Andy used nonsense syllables to illustrate a part of this concept in his presentation. It is essential to keep in mind that no material is inherently meaningful in and of itself. It has meaning only as it relates to existing ideas and knowledge. What is meaningful for the person who is knowledgeable about the topic, the instructor, may not be meaningful to the person who is attempting to learn about the topic, the student. Our problem is to find those themes, contexts and experiences which can provide the basis for meaning. We can develop meaningful relationships for about everything except the alphabet - there simply is no good reason why B should follow A except by common agreement.

(Simple to Complex) I will attempt to extend the principle of meaningfulness to this second principle. Everyone agrees that the principle of developing from simple to the complex is highly desirable. Determining what is simple and what is complex must be made from the

learner's point of view. All too often we start at the wrong end of the sequence. This error probably occurs more often in the health field than in some others because much of the teaching is derived from highly structured taxonomies in the supporting disciplines. Instructors have learned that the taxonomy of zoology, and anatomy, utilizes an ordering of simple to complex that starts with the cell, then tissues, then organs and finally a system. I suggest that the simple to complex ordering for a student in the health field is opposite that of the formal discipline taxonomy.

An example may help to clarify the point. Any of you can teach a third grader the basic concepts of human physiology and provide an accurate and efficient basis for further learning by starting with a system; but you would have great difficulty if you start with cells. The concept and understanding of a cell is the most difficult because it is the most removed from prior experience. He has never seen a cell or been able to observe its functions. BUT - every third grader knows that he breathes. He breathes air which has oxygen in it; therefore, there must be some system in the body to use this oxygen. Or, he eats; there must be some system to handle the food. These points of departure are <u>meaningful</u> and <u>simple</u> - in <u>his</u> terms. From such starting points you may proceed to - what is the purpose of the system? What functions must be performed? To make the total system perform, each specialized function must be carried out by a particular organ. Hence, the organ must be composed of specialized tissues to carry out their function. The tissues, then, are made up of different kinds of small cells which are themselves very complex. Even though there are many different kinds of cells, each is made to do its own job. In practice, too many instructors start with the idea off cells under assumption that they will be moving from the simple to the complex -- is it?

(Distinction between a Discipline and Subject Matter) Stern has made this point earlier, but I believe it is worth re-emphasis. The above example illustrates the difference between teaching consistent with a discipline or teaching of a subject - physiology. Very often we hear scientists and academicians who are highly prepared in a discipline such as chemistry, physics or anatomy bemoan educational programs for "watering down" a subject. I think what they are basically objecting to is the fact that a <u>subject</u> is being taught - at the specialists level of competence, any departure from teaching the discipline in the formal structure of the discipline is a watering down. At the graduate level, subjects and disciplines tend to blend as one. At lower levels, subjects are drawn from disciplines and most likely will not be taught in the formal taxonomy approach. What is sometimes viewed as undesirable watering down may actually be a very desirable difference in strategies, each appropriate to the quite different objectives of different programs.

("Cook Book" Materials) I'm sure several of you came to this Institute with the expectation that complete materials would be provided and specific procedures for their use given. Our purpose is really quite different; it is to provide background content and materials that can be used in conducting teacher education activities.

Many publishers and agencies have developed cookbook materials for use in educational programs. When I was younger, and at least somewhat more naive, I was quite appalled that such materials were produced and that some teachers used them. I felt that such materials would reduce the quality of instruction as the understanding and supporting ideas were most important. I have mellowed a bit and now see a positive role for such materials; even though I still feel that many are of poor quality and are often misused.

On the positive side, they tend to help establish a minimum level or foundation for the weak instructor. No good teacher ever reduced the quality of his teaching because such materials were available. He may use them selectively or as a supplement and will find a way to improve upon them even if their use is prescribed. Now consider the weak teacher for a moment. He needs all the help he can get. What would he do without materials to help guide him and to provide a minimum level. It may be that some cookbook materials will be developed from the materials of this Institute. We are attempting to provide a more broad base.

Another suggestion I would like to make is in the area of the need for sharing materials we develop. We all generate many kinds of materials, but we seldom mimeo or ditto them and make them available to others because they may not be as good as they ought to be; they can always be made better. This is particularly true in developing areas, we hang on to materials - knowing they could be better - but in new areas the need to share is even greater. So mark your materials as "preliminary drafts," or "for discussion only," and share them. Comments from others may be the best source of help in improving your materials. Help others and they will help you.

(Process as Content) The <u>way</u> you do something is very important. Some things can only be learned by the way you go about them; the atmosphere, if you will. A negative example of this would be the teaching of problem solving by the lecture method. Again, learning only occurs if it is meaningful.

Anything you present goes into the learners predetermined, dynamic mass of knowledges, principles, generalizations, and becomes attached to, or associated with, past learnings. The new knowledge may become attached to the wrong existing learning. To prevent this from occurring is where an overview--or preorganizer as proposed by

Ausubel--is so important. Before you start a lesson, including the day before, let the learners know the essential ideas you will be discussing. Indicate the kinds of principles and knowledges that will be involved. Anticipate, as best as possible, the kinds of prior ideas and facts that might get mixed-up with the new learnings you consider important. Organize the students' mental structure into which you're going to present the material, then present the experiences, and finally follow it up by reviewing or pulling it back together again. If we recognize that some ideas are more likely to get mixed up, if we know that each point will mean different things to different people, we can attempt to reduce learning problems.

There must be some possibilities for the learner to do something with his new material, to compare alternative interpretations. This is where passive acceptance of ideas by the learner is risky and where straight lecture may become dangerous. The learner needs an opportunity to discuss, to clarify whether he has properly understood and a chance to integrate his new information with the old. We must allow the learner to be wrong during this process so he can improve - rather than finding out later in the employment situation.

## INSTRUCTIONAL MEDIA

(Editor's note: Because of the extensive use made of audio and visual materials in each of the four presentations on instructional media at the H.O.E. Teacher Education Institute, no attempt was made to tape record these presentations. Therefore, the following is not a supportive paper as such, but rather the editor's resume of the general areas and topics covered.)

### General Introduction

An introduction[1] to the instructional media topic was presented by Calvin E. Mether.[1] By use of a multi-media presentation the participants were dramatically introduced to the many dimensions of communications as seen by the instructional media specialist. Varied effects which can be created through different media were demonstrated. The advantages of using particular techniques to achieve specific goals were shown.

Mr. Mether made a good case for the use of an emotional channel to learning. Through the use of color--black and white, sound--silence

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[1]Mr. Mether, College of Education, The University of Iowa

and various intermixes of these ingredients he was able to set moods which would certainly affect how the receiver would react to the content presented.

Discussed in general terms were: the desirability of using a multi-sensory approach, communications problems, and various aspects of hardware and software in the instructional media field. As an example of the use of portable cassette tape recorders, Mr. Mether involved the participants in small group activities, a part of which was to record the output of each of the groups and to play back the results to the entire group.

## Single Concept Films and 2x2 Slides

Films and slides had been used as part of the introductory presentation to the topic of instructional media. It was the task of Keith Dollinger[1] to pursue in more detail the use, availability, and production of single concept films and 2x2 slides.

A film loop projector was demonstrated and the uses of single concept films were discussed. This discussion included consideration of the availability of equipment and commercially produced films, the advantages of motion over still pictures for certain types of learnings and, very briefly, the production of single concept films.

Following a general discussion of 2x2 slides, Mr. Dollinger gave a slide presentation on slides and their production. Included in this presentation were suggestions on such things as: labeling, size relationships, the inclusion of humans in pictures, showing emotions, combinations of diagrams and pictures, cause and effect pictures, cartooning, amateur sketching, and micro-photography.

## Audio-tutorial Systems

In recent years educators have seen great value in individualizing instruction. The audio-tutorial and other approaches to independent study have been gaining in popularity. James Orth[2] made a slide presentation designed to challenge the participants' view on instruction, a comparison of the more traditional teacher-centered approach and the learner-centered approach, and more specifically a look at the development and use of independent study systems.

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[1]Mr. Doellinger, College of Education, The University of Iowa.
[2]Mr. Orth, Midwest Visual Education Service, Des Moines, Iowa.

Following a look at a variety of types of instructional encounters, Mr. Orth asked the participants to consider the role of both the educator and the student in each of the various types of instructional activities and to consider the implications which these roles have on the ultimate goal of changing the behavior of the student. From this point, he moved specifically into independent study systems and pursued those considerations which are appropriate once one has "bought" this concept.

It was indicated that the use of study carrels is essential to most types of independent study programs and their use brings about specific problems. Space must be provided and time schedules must be arranged so that students may have an opportunity to use them. The type of carrel, or quest area, to be used must be decided in light of the use to be made of them and the financial resources available. There is quite a variation in the sophistication of equipment available for this type of activity. Also of considerable concern to those planning to move into this type of instruction is the programs to be used. Are commercial materials available? Do they fit the existing needs? Do we have the capabilities necessary to develop the software?

## Overhead Transparencies

This topic, presented by Robert Long,[1] was designed to acquaint the participants with how overhead transparencies are used and produced. As part of his general approach to this topic, Mr. Long presented five principles to be followed in preparing transparencies. It was suggested that one should: (1) consider the type of audience, (2) estimate the size of the group, (3) ascertain the best possible type of transparency, (4) make the example or display as concrete as possible, and (5) keep the visual simple. The point was stressed that the transparency shows and the teacher tells. This should be considered in preparing and in using transparencies.

Mr. Long demonstrated how several types of transparencies are made and showed several special techniques which can be used when producing visuals. The equipment on which transparencies are made was available for the participants to use during the evening following this presentation. Mr. Long assisted those who chose to have "hands-on" experience with the equipment.

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[1]Mr. Long is, Associate Director, Audiovisual Center, The University of Iowa.

## PANEL DISCUSSION - ADMINISTRATION AND COORDINATION

(H.O.E. Teacher Education Institute)

Panel Members:

Lawrence Borosage, Professor, Michigan State University
Elizabeth Kerr, Director, Program in H.O.E., The Univ. of Iowa
Don Cordes, Administrator, Iowa Methodist Hospital, Des Moines
Dwight Marshall, Dean, College of Gen. & Tech. Studies, Univ. of Nevada
Easton Smith, School of Inhalation Therapy, Orlando, Florida

(Note: The following is a synthesis of the topics discussed by this panel. The statements or opinions do not necessarily represent a consensus of the entire group.)

Program Development

The challenge to educators is overwhelming.

(1) We must identify what the technician is and what skills he should learn.
(2) The health administrator's expectations are important in preparing these health occupational personnel.
(3) We must pursue additional knowledge concerning the dynamically changing role of the health occupations.
(4) We must recognize and establish priorities on the federal, state, and local levels.

New educational programs and innovations often start from a "think committee," which has a broader base from which to operate than an advisory committee.

Amendments to the Vocational Education Act.

(1) Plans that are submitted by the state set forth first of all the long range program plan for vocational education in the state, which has been prepared in consultation with the State Advisory Council.
(2) This plan describes the present and projected vocational educational needs of the state in terms of the purpose of the title.
(3) Due consideration will be given to the cost of the programs, services and activities provided by local educational agencies which is in excess of the cost which may normally be attributed to the cost of education in such local educational agencies.

Application of these amendments makes us look at vocational education more critically.

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Advisory Committee

How do you use an advisory committee to make sure that the education is realistic to the work situation in which the trainee is going to function?

The way we structure advisory committees is very often unrealistic. We try to include the obvious political power in the community and the obvious health specialty power. It becomes the role of the educational administrator to straddle the fence between these two powers. There needs to be some neutral ground within the advisory committee. This group should be made up of objective and representative people from within the community.

Why do we have to have separate advisory committees for every health occupation? Some schools have an over-all health occupations advisory committee, with sub-committees in each specialty.

What can an advisory committee do? These are advisory committees, not policy formulation committees. To the extent that their contributions add to policy, we can accept their advice but they are not responsible for the making of policy.

There is a two-way communication task for advisory committees.

(1) They should bring feedback to the educational program.
(2) They should also provide feedback to the employer to help prepare a place within the work organization for the new health occupation. The work situation may have to be restructured to assimilate these new trainees within the "pecking order" that presently exists in the hospital or health organization. This will assist the trainee to function in the way that he was trained to function.

There should be an academician representing colleges and universities on the advisory committee. He may not contribute a great deal, but he can assist in developing the means to allow horizontal and vertical mobility for students in the health occupations. He can help to break down the "brick wall" of credit transfer around colleges and universities, to develop the potential for the student seeking advanced education to build upon his education in health occupations without starting from the beginning again.

How can the advisory committee help in the process of evaluation?

(1) By a facilitative function such as devising an evaluation plan.
(2) By collecting data.

Summary of three areas of advisory committees to be looked at.

(1) Greater consideration should be given to the composition of the advisory committee. Should there be an academician on the committee?
(2) How to determine the role of the advisory committee. Is it primarily for policy considerations, evaluation, etc.?
(3) How does one orient an advisory committee to it's responsibilities?
    a) The initial meeting is very important for the orientation begins here.
    b) A handbook of guidelines may be necessary.

Use advisory committees, but not as window dressing. Take the advisory committee relationship as seriously and use it as wisely as you do your paycheck.

Who has the authority or responsibility for setting up the advisory committee in the first place? There are two sides to this coin.

(1) Advisory committee is advisory to whom?
(2) Do you select individual advisory committee members, or try to get equal representation from all concerns? When you want the support of a particular group, it is easier if you have a member from that group on the advisory committee.

What is the relationship between the educational program and the clinical affiliate? More specifically, who is responsible for what?

General Education versus Special Education

How much general education or special education should you have? Large corporations more often want generally educated personnel. There are several fallacies connected with the problem of general education versus special education.

(1) The fallacy of "either/or." Either general education or technical education.
(2) The fallacy of looking at only one side in the interaction process--that of the recipient organization as a determiner of curriculum. Education has an obligation to look at the needs of the student.
(3) We constantly hear the cry, "Make education relevant." What does this mean to the student? General education is indespersible to the student preparing for an occupation. Therefore, a break away from the dichotomous way of thinking, the either/or syndrome or a fixation on the recipient institution rather than the student is needed.

A fundamental point in relation to large and small organizations is that the health occupations are mostly in small organizations. The small type of health organization does not have the resources to provide education. Thus the hospital administrator is generally looking for the technically specialized person not the generalist. This specialist is not likely to be as mobile, and does not progress up the educational ladder as easily as one with another type of preparation.

We don't know when we are getting Ph.D material, therefore general education is important. We do have to think of career orientation and provide as much general education as possible. Hospital administrators want technical skills now. Educators want to start an educational process that prepares the student to advance technically over a long period. "You can't be all things to all people." It is important for the student to know where he is going. Some may want to transfer, so they should know about the opportunities available to them.

A study was done of industrial technical school graduates. Graduates were asked, "How much general education should the trainee have?" The range of response was from 20% to 50% of the total time should be put into general education. Educators should look for clues such as the student's and supervisor's statements that the number one problem with graduates is communication. The curriculum, on examination had only one course that dealt with communication.

Technicians have to work with people. Therefore, health occupations programs and continuing education should prepare technicians for such a role.

When discussing general education, we must define exactly what we mean by it before we arrive at any conclusions. Does it include related and integrated education or only "pure" general education?

What are we looking for in a student?

(1) A curious mind.
(2) Flexibility--Some graduate with a fixed idea of what should and should not be found in the work situation. They must be flexible.
(3) Adaptability--graduates must be able to adapt themselves to the work situation.

General education is not a responsible education. History, psychology, and chemistry are based on the traditional thinking that general education makes us feel good. They do not tell us how to get along in a work situation. Thus "pure" general education is a waste of time. Let's have a course in how to get a job.

## Coordination and Operation of Educational Programs

One of the most difficult problems we have is the employing institutions. How do we structure the organization to provide a ladder of upward mobility for our graduates within a hierarchical authority structure?

Employers can help the program by providing feedback as to where the trainees fit within their organization, and then curricula can be revised to provide for better assimilation of the trainee into the health organization.

Are health educators proliferating the health occupations field with technical people or are health occupation employers coming to the health educators demanding that people be trained for special purposes?

We are attempting to do something to optimize the M.D.'s time. An example of one problem which occurred was the difficulty of an employing agency to fit a new type of specialist into their structure. More lead time might have been provided with better planning.

Cooperation between clinical institutions and educational institutions is important. Contractual agreements need to be developed between the educators and service personnel.

## Program Evaluation

Five areas of evaluation that we must deal with:

(1) Sharpening up our evaluation skills and tools in making determinations about the impact of the professional field itself.
(2) Administrative arrangement of the program.
(3) The curriculum plan.
(4) What are we going to do from the standpoint of in-course evaluation while students are involved in the classroom?
(5) What is the labor market behavior of these people subsequent to the training period?

The role of national boards on the evaluation of specialties must be recognized. We have minimum standards established. General education evaluation by these boards has a proper place in the health occupations field.

# REPORT OF SMALL GROUPS ON ADMINISTRATION AND COORDINATION

(H.O.E. Teacher Education Institute)

Following the panel discussion on administration and coordination at the national teacher education institute the participants had an opportunity to discuss the topic areas in small group sessions. One individual from each of the groups made a report to the larger group.[1] The following is a synthesis of their reports.

## Program Development

Two models of technical education were suggested for further investigation.

(1) Armed services technical programs.
(2) Department of Labor technical programs.

Educational programs must provide the leadership for development of some occupational areas.

(1) Educational staffs provide the coordination of activities.
(2) To bridge the gaps of development, involve the medical and social community.

Concern was expressed that shortages at the lower technical levels are perpetuated by over educating and that technical levels will be filled only after administrative and teaching positions are filled.

## Advisory Committees

What should the composition of an advisory committee be?

(1) Educator with expertise in the occupational field should be chairman.
(2) Faculty member with expertise in developing programs should be included, possibly as secretary.
(3) If the purpose of the advisory committee is to educate the committee members, then choose committee members who can be manipulated.
(4) If the purpose of the advisory committee is to educate the community, then choose committee members who are manipulators and persuaders.

[1]Appreciation is extended to the following individuals who served as recorders for this session: Patricia A. Amos, Beth Goldberg, Mary H. Hume, Julia A. Milroy and Virginia M. Vollmer.

What is the role of the advisory committee?

(1) Recruitment of instructors.
(2) Survey community needs.
(3) Student placement and counselling.
(4) Public relations.
(5) Legal advice.
(6) Establishment of scholarships and financial assistance.

How often should the advisory committees meet?

(1) Whenever there is a need.
(2) Informal meetings can be used on a one to one basis via telephone and memorandum.

If the advice or recommendations of the advisory committee cannot be implemented, the reasons should be explained to the committee.

The establishment of an ad hoc committee will provide a source of committee members for the advisory committee.

How do we orient advisory committees?

(1) In the initial stage, any group is in a dependent situation looking for leadership. Whoever calls the meeting should assume leadership.
(2) An advisory committee has both an educative function and an advisory function.
(3) Ask the advisory committee, "What do you think should be taught?" But never, "How should it be taught."

The focal point of the advisory committee is communication.

(1) Objectives should be clearly stated.
(2) Minutes of the meetings should show the identity of contributors.
(3) Recognize individual differences of committee members.
(4) Evaluate by looking at accomplishments.

How does the committee perceive itself?

(1) Some committees become self-perpetuating and the committee must analyse itself for accountability.
(2) Committees are not accountable, only people are accountable.

General Education

Agreement that there is a definite need for general education.

(1) What is the relevancy of general education?

(2) What are the goals of general education?

Should general education courses be an integral part of the curriculum or simply enrichment courses?

(1) Courses should be made relevant.
(2) Sociology and psychology should be geared to student needs and not to the perpetuation of the course.

Hospital-based training programs versus educational institution based training programs.

(1) Need to consider each individual situation.
(2) Contractual aspects of training programs.
(3) Legal aspects.
(4) General problems of each type of training program and alternatives to providing the clinical experiences.
(5) Guidelines are available from licensure agencies, American Association of Junior Colleges, etc.

Coordination and Operation of Educational Programs

Educational programs should provide a sensitivity to the needs for education.

(1) Use of "think" groups for general discussion and exploration.
(2) Educational needs must be sensitive to the medical and social community.

Educational programs must face the reality of economic constraints and priorities must be set, striking a balance between over and under training, generalized and specialized education, with coordination of activities to optimize the level of patient care.

The primary responsibility of the education program is to the student.

With agreement that institutions are hierarchical, the student should be prepared to assume a hierarchical position.

(1) Need for more studies to determine the causes of non-acceptance of change.
(2) Inform employers of the skills of the students.

Hospital administrators view the problem of administration as how to reconcile the demands of patient care and employee satisfaction. Should the educator, the employer, or the employee be responsible for developing sensitivity to human needs?

Program Evaluation

Revision of the curriculum must be based on constant re-evaluation.

(1) A follow-up study of each class should be performed to identify weaknesses in the curriculum.
(2) Employers should be questioned to determine if the student was adequately prepared for the job.
(3) An analysis of future developments in patient-care will enable the curriculum to keep abreast of the employer's future needs.

A dialogue should occur between consumers, coordinators, professional groups, and faculties to provide an advisory function to the program.

Changes in educational programs must be based on legal and administrative guides and standards.

(1) Implementation for change should include the boards, certification agencies, state and federal agencies, and other "accreditation" agencies who provide direction and standards.
(2) These agencies should periodically be evaluated and revision of standards should occur.

MODULAR UNIT V

## Evaluation in the Educational Process

Guidelines:

- Educational Objectives
- Instructional Strategies
- Annotated Bibliography
- Supplementary Materials
  - Some Considerations Regarding a Comprehensive Plan of Evaluation
  - Analysis of Types of Questions and Tests
  - Guide to Faculty Performance Appraisal

Supportive Papers:

- Evaluation in the Educational Process -- Lawrence Borosage
- Faculty Evaluation -- Duane Anderson
- Writing Classroom Tests -- Charles Porter
- Scoring, Compiling Scores and Grading -- Charles Porter

5. Following completion of this modular unit, the participant will demonstrate an awareness of the role of evaluation in the educational system.

5.1 The participant will consider all evaluation areas as parts of a comprehensive plan of evaluation.

5.1.1 Describes the purposes of evaluation.

5.1.2 Identifies the components of an overall evaluation program.

5.2 The participant will examine the process of evaluating faculty performance.

5.2.1 Describes the merits of evaluating faculty performance.

5.2.2 Cites individuals or groups who are potential faculty evaluators.

5.2.3 Describes selected methods used to evaluate faculty performance.

5.2.4 Identifies what factors should be evaluated.

5.3 The participant will describe the purposes for measuring achievement.

5.4 The participant will recognize preparatory procedures essential to the development of valid achievement tests.

5.4.1 Utilizes educational objectives as the basis for developing tests.

5.4.2 Plans a distribution of test items which will proportionately sample the educational objectives.

5.4.3 Selects achievement tests appropriate for the particular use they serve.

5.4.4 Selects types of test items which are appropriate for measuring the kinds of learning outcomes desired.

5.5 The participant will develop achievement tests.

5.5.1 Recognizes desirable characteristics.

5.5.2 Designs objective, essay and performance tests.

5.6 The participant will recognize appropriate steps for assembling and administering tests.

5.7 The participant will recognize suitable techniques for scoring tests and appraising test items.

5.8 The participant will apply appropriate methods of treating test scores and assigning grades.

5.8.1 Describes test scores in terms of selected mathematical statistics.

5.8.2 Utilizes standard scores and percentiles.

5.8.3 Converts test scores to grades.

5.8.4 Compiles grades or scores to produce a composite.

## INSTRUCTIONAL STRATEGIES

A general presentation covering an overview of the evaluation process for the purpose of defining and describing a comprehensive plan for evaluation is suggested to initiate this unit. It is essential to consider the multi-dimensional and multi-level aspects of evaluation. An attempt should be made to assist the participants to distinguish between th cerms "evaluation" and "measurement." The purposes of evaluation should be a primary element of this topic. It is also particularly important that participants be made aware of the relationship of evaluation to other components within the instructional system.

It is suggested that faculty evaluation be treated as a separate topic and that particular emphasis be made that the primary purpose of such evaluation is for self-improvement. Because of the uneasiness which many individuals feel regarding this topic it is suggested that at least part of the time be spent in some type of interaction activity so that the participants have an opportunity to relieve their fears about being evaluated. Small group activities for the purpose of developing such things as evaluation criteria and procedures are appropriate.

The topics of constructing achievement tests, handling test scores and assigning grades require active participant involvement for optimum benefits. It should be stressed that achievement tests support and reinforce other instructional activities. Participants should be provided an opportunity to plan an achievement test, write test items, convert raw scores to standard scores and to assign grades. This can be done through individual assignments or small group activities. Particular emphasis should be placed on the need for the learning outcomes measured by a test to faithfully reflect the educational objectives of the course.

## ANNOTATED BIBLIOGRAPHY

Allen, P.M. "The Student Evaluation Dilemma." Today's Education, 1969, 58(2), 48-50.

The problems and frustrations of evaluating students are explored by Allen in this article. Present day evaluation procedures and their accompanying results are related to the psychologists in the stimulus-response and operant conditioning camp. The need for a system of self evaluation is supported by the author, though the need for a two-track system of evaluation is proposed.

Amidon, E. & Hough, J.B. Interaction analysis: theory, research and application. Reading, Mass: Addison-Wesley, 1969.

Part One of the book deals with educational and social psychological theories of classroom climate. Part Two discusses the empirical development of interaction analysis as a technique for assessing classroom social-emotional climate. Part Three deals with the application of interaction analysis to problems of teacher education. This organization is in accordance with the way in which knowledge in the behavioral sciences is developed and translated into practice.

Cohen, A.M. & Brawer, F.B. Measuring faculty performance. Washington, D.C.: American Association of Junior Colleges, 1969.

This monograph examines the current status of faculty ratings, discusses problems in establishing criteria for faculty evaluation, and considers the question of why evaluation should be conducted at all. As its main thrust, it presents a rationale for change. It builds a case for abandoning current practices of faculty evaluation in favor of genuine research on human functioning, on instruction, and on relationships between the two. Includes an extensive bibliography.

The evaluation of teaching. Report of the Second Pi Lambda Catena, Washington, D.C.: Pi Lambda Theta, 1967.

This book brings together five position papers concerning "The Evaluation of Teaching" as well as the discussions in regard to these papers as a colloquy held at Airlie House in Warrenton, Virginia, August 19-21, 1966. When the topic was selected as a theme for study by Pi Lambda Theta, it was done with awareness of the varying perceptions that exist about teaching and the manner in which teaching should be evaluated. Thus, the papers reflect a diversity of points of view in line with the variety of interests represented by the five colloquy participants. These interests range from teaching and learning as seen from the perspective of the broader social context to more detailed analysis of the teaching act itself.

Gronlund, N.E. Constructing achievement tests. Englewood Cliffs, N.J.: Prentice-Hall, 1968.

This book is intended for teachers and prospective teachers at all levels, and for others who are responsible for constructing achievement tests. Its main aim is to assist in the construction of achievement tests which measure clearly defined learning outcomes that are in harmony with instructional objectives. A basic theme of the book is that achievement testing should support and reinforce other instructional activities designed to improve learning.

Locating information on educational measurement: sources and references. Evaluation and Advisory Series, Princeton, N.J.: Educational Testing Service, 1969.

This publication attempts to classify and annotate a sampling of reference works and source materials in educational measurement. It is designed to provide students, educators, psychologists, and researchers in educational measurement with an aid in literature searches. In the rapidly expanding field of educational measurement, the volume of literature has increased to the extent that the scholar confronted with a literature search is frequently hard put to locate and select, from an overwhelming array of publications available, those materials that will be useful and appropriate for his particular concern. This booklet suggests a systematic plan for literature searches. Four major types of source materials: reference works, books, professional journals, and the materials issued by test publishers are arranged in a sequence that moves from the general to the specific. Preceding the section for each type of source material is a description of the characteristic of the material included in it. Annotations of materials are descriptive rather than evaluative. They are intended only to help the reader discover publications relevant to his questions. This booklet is available from the publisher as part of a test and measurement kit which they will provide without charge upon request.

"Test Service Bulletin." Nos. 36-57. New York, N.Y.: The Psychological Corporation.

This series of publications contains articles on a wide variety of topics in the field of testing such as: What is an aptitude? The correction for guessing, methods of expressing test scores, how accurate is a test score and testing job applicants from disadvantaged groups. These articles, which are available without cost from the publisher, have many helpful suggestions for both the classroom teacher and the individual who is studying the testing field in depth. Most of the articles are written so that they are readable by those with little or no background in testing or statistics.

Note: The availability of the comprehensive bibliography contained in Locating information on educational measurement: sources and references eliminates the need for additional references on the subjects of evaluation and measurement to be included in this annotated bibliography.

## SUPPLEMENTARY MATERIALS

### Some Considerations Regarding a Comprehensive Plan of Evaluation

Lawrence Borosage
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Most evaluation in vocational-technical education in the past has had its chief focus on the attainment of knowledge and performance skills in the classroom or laboratory situation. Evidence of this emphasis is reflected in the recent federal legislation in which the federal - state - local programs of vocational-technical education are mandated to give greater accountability of their performance. It is indeed unfortunate that a federal mandate is necessary in order to bring about that which should be an integral part of any educational venture.

This treatment of evaluation presents in broad outline the elements of a comprehensive plan of evaluation.

Definition: Evaluation is the process of assessing the degree to which an educational program is meeting its stated purpose. It is the comparison of actual conditions with desirable conditions. It seeks to answer the question, "To what extent are we doing what we say we are trying to do?" It includes measurement.

Purpose of Evaluation:

1. The chief purpose is to provide greater psychological security and morale to the staff responsible for training both individually and collectively.

2. The second purpose of evaluation is to validate the total approach to training that is used in the organization.

3. The third purpose is to determine whether content in a training program is functional.

4. The fourth purpose is to determine needed modifications in instructional method.

5. The fifth purpose is to provide information basic to effective guidance in an individual development program. Only as we appraise individual achievement are we in a position to plan additional improvement.

6. The sixth purpose of evaluation is to provide a sound basis for public relations.

7. The seventh purpose is to examine the extent to which financial resources have been used effectively.

Some Principles of Evaluation

1. Evaluation offers the greatest potential benefit if it is a long-time continuous, built-in part of the total training process. This includes long-range as well as short-term appraisals.

2. Evaluation should be concerned with results rather than effort expended.

3. Evaluation must be multi-dimensional as well as multi-level in the arrival at conclusions.

4. Self-appraisal is better than appraisal by outsiders although a combination of self and outside appraisal is still better.

Areas of Evaluation in an Educational Program

Evaluative considerations involve a variety of areas each providing evidence to determine the extent to which an educational program is meeting its goals. Complementarity must be established among the various areas resulting in a totality of approach rather than a fragmented and disjointed effort.

Area 1. Impact on the Professional Field

This is an appraisal of the effects of an educational program on the professional field both on a macrocosmic and microcosmic level. As a result determinations can be made quantitatively and qualitatively of the manpower dimensions on the national, state and local levels. In addition appraisals can be made of the work force behavior in a specific institution such as a hospital, clinic or physician's office. In looking at the impact on the professional field, we are searching for:

(a) A degree of stability between supply and demand of professional, para professionals and others employed in the field.

(b) An adequate reservoir of talent to meet promotion and expansion needs.

(c) Greater consumer satisfaction of services rendered.

(d) An improved internal climate of operations.

(e) Improved intra-communication among professionals in the field.

| How Determined | Positive Indicators |
|---|---|
| 1. Study by manpower analysts. | 1. Sufficient number of entrants into the field. |
| 2. Personnel studies. | 2. Retention rate acceptable to maintain stability. |
| 3. Interview consumers of service or product. | 3. Reasonable satisfaction with products or service. |
| 4. Internal attitude survey. | 4. Better teamwork and communications among organizational segments. |

Area 2. The Administrative Arrangement of a Program

(a) The policy framework governing the conduct of the educational program.

(b) The manner in which the program is administered.

(c) The method of planning the training program.

(d) The caliber of staff.

(e) Physical setting in which program exists.

(f) The resources such as library, reference materials, instructional aids.

(g) The overall tone or climate in which the training effort exists.

| How Determined | Positive Indicators |
|---|---|
| 1. Evaluative criteria established professional area. | Usually determined by standards established by those involved in the evaluation. |

2. Study by outside impartial agency.

3. State consultants and teacher educators.

4. Accrediting and licensure procedures.

5. Advisory committee to the program.

Area 3. Curriculum Plan

(a) The philosophical base for occupational education.

(b) Criteria for selection of the occupational training program.

(c) Procedure followed in determining needs for offering instruction in the occupation.

(d) Derivation of objectives.

(e) Assessment of input data.

(f) Rationale for pre and post examinations.

(g) Determination of content.

(h) Utilization of instructional strategies.

(i) Evaluation procedures.

Area 4. In Course Evaluation of Student Progress

Evaluation in this area can provide some indication regarding effectiveness of the immediate process. It provides some clues at the time that instruction is actually going on at the classroom, laboratory or clinical level.

In-course appraisal should concern itself with:

a. Increased understanding.

b. Development of skills.

c. Changes in attitude.

d. Evidence of interest.

e. Acceptance of training.

f. Involvement.

| How Accomplished | Positive Indicators |
|---|---|
| 1. Equivalent forms of the same test at the beginning and end of training. | 1. Significant increase in test score at the end of training. |
| 2. End-of-course information test. | 2. Good performance on information test. |
| 3. Task assignments. | 3. Satisfactory results on assignments. |
| 4. Attitude questionnaire prior to and on completion of training. | 4. Favorable expression particularly when supported by open-end responses. |
| 5. Reports of "process observer." | 5. Evidence of productivity in reaching goals. |
| 6. End-of-session appraisals. | 6. Favorable expression of the session. |
| 7. Attendance. | 7. Attendance is satisfactory. Absences supported by defensible reasons. Participants are on time for sessions. |
| 8. Listening to student's comments. | 8. Out-conference discussions and questions related to in-course content. |
| 9. Follow-up in clinical situation. | 9. Favorable appraisals by clinical personnel. |

Although this area of evaluation is significant, it does not necessarily imply that change in behavior will result in the on-the-job situation as a result of positive indicators identified above. Unfortunately, in too many cases evaluation is limited to this phase.

Area 5. Impact on Students Subsequent to Formal Training

Unless changed behavior is evidenced in the on-the-job situation, a formal training program can be seriously challenged. This established the imperative need for

involving those responsible for the participant's work in the training program.

(a) The transfer of instruction into changed behavior on-the-job.

(b) The progress made in meeting specific objectives of training.

(c) Indications of improved efficiency, service, and employee satisfaction.

| How Determined | Positive Indicators |
|---|---|
| 1. By asking participants at periodic intervals after the completion of formal training how they have benefited. | 1. Participants report positive benefits. |
| 2. By having participants fill out questionnaire at intervals following training. | 2. Evidence is presented of problems solved and improved efficiency. |
| 3. Attitude surveys. | 3. Increase of positive responses. |
| 4. Post-training meetings where program can be reviewed. | 4. Participants report successful results. |
| 5. Direct observation of participants at their work station. | 5. Actual usage on-the-job of what has been taught. |
| 6. Work performance review by superior. | 6. Positive progress in areas in which training was provided. |
| 7. Spot-check of consumer's attitude toward service rendered. | 7. Satisfied consumer. |

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ANALYSIS OF TYPES OF QUESTIONS AND TESTS

| TYPE | BEST APPLICATIONS AND PURPOSES | WEAKNESSES | SUGGESTIONS FOR IMPROVEMENT |
|---|---|---|---|
| 1. TRUE-FALSE<br><br>Scoring Method<br><br>Score = Rights minus the wrongs | 1. To check technical knowledge<br>2. To check knowledge of procedures | 1. Difficulty in forming questions<br>2. Encourages guessing | 1. Avoid tell-tales as --<br>a. Never<br>b. Sometimes<br>c. Always<br>d. Often<br>e. Usually<br>2. Avoid negative statements<br>3. Use "T", "F", and "D" for responses:<br>"D" = Don't know<br>4. Avoid all patterns or sequences in correct response-position<br>5. Explain scoring system<br>6. Provide unequal number of "T" and "F"<br>7. Write wrong questions first |
| 2. MULTIPLE CHOICE<br><br>Scoring Method<br><br>Score = $R - \frac{W}{N-1}$<br>R = Rights<br>W = Wrongs<br>N = Number of responses presented for each item | 1. To check nomenclature<br>2. To check functions of parts<br>3. To check judgment<br>4. To induce thinking | 1. Difficulty in writing<br>2. Difficulty of interpreting best answer | 1. Use 4 or more responses<br>2. See that all responses are sensible<br>3. State response-method clearly<br>4. Score = $R - \frac{W}{N-1}$<br>5. Avoid patterns in placement of correct answer<br>6. Provide same number of choices for each question |

| TYPE | BEST APPLICATIONS AND PURPOSES | WEAKNESSES | SUGGESTIONS FOR IMPROVEMENT |
|---|---|---|---|
| 3. MATCHING<br><br>Scoring Method<br><br>Usually 2 or more points for each pair correctly matched | 1. To check nomenclature<br>2. To check functions of parts<br>3. To check relationships<br>4. To promote thinking | 1. Difficulty in avoiding misinterpretation of certain items<br>2. Requires much "hunt and find" | 1. Provide uneven or unmatched columns, or a few non-matching pairs<br>2. Limit each section to 15 or 20 pairs<br>3. Place all on one page<br>4. Write first in correct order, then mix one column |
| 4. COMPLETION<br><br>Scoring Method<br><br>Usually 1 or 2 points for each blank correctly filled in | 1. To check nomenclature<br>2. To check function of parts | 1. Emphasizes memory<br>2. Stresses speed in reading | 1. Keep blanks near end of sentence<br>2. Avoid tell-tales; use "a", "an", "is", "are"<br>3. Write complete statement and then remove words<br>4. Make clear, concise statements<br>5. Limit the number of blocks in any one sentence<br>6. Require correct terms in all responses |
| 5. IDENTIFICATION<br><br>Scoring Method<br><br>Usually 1 or more points for each correct identification | 1. To check nomenclature<br>2. To check function of parts | 1. Requires memory rather than thought | 1. Restrict to one page<br>2. If pictures are used be sure they are clear |

| TYPE | BEST APPLICATIONS AND PURPOSES | WEAKNESSES | SUGGESTIONS FOR IMPROVEMENT |
|---|---|---|---|
| 6. ORDER-ARRANGEMENT<br><br>Scoring Method<br><br>Varied and difficult; partial credit sometimes given | 1. To check knowledge of procedures<br>2. To check thought and technical knowledge | 1. Difficulty in scoring<br>2. Difficulty in stating | 1. Write first in correct order, then mix<br>2. Provide clear response method<br>3. State problem definitely<br>4. Require that responses follow the procedures taught |
| 7. ORAL<br><br>Scoring Method<br><br>Usually 5 or 10 points for each question correctly answered; questions are sometimes "weighted"; partial credit usually given | 1. To discover way learner attacks question or problem<br>2. To encourage some learners to more complete expression than usual<br>3. To promote thinking | 1. Speaking ability rather than knowledge may influence score<br>2. Lacks objectivity<br>3. Easy for learner to "ramble" when answering<br>4. Difficult to score | 1. Make questions clear and definite<br>2. Have in mind the basic points required in correct answer<br>3. Limit score of each question<br>4. Weight question in scoring |
| 8. SHORT ANSWER<br><br>Scoring Method<br><br>Usually 1 or more points per question; partial credit seldom given | 1. To check technical knowledge<br>2. To check nomenclature<br>3. To promote thinking<br>4. To give a thorough check of material covered | 1. Requires little writing ability<br>2. Difficulty in writing definite and concise questions | 1. Form definite, short concise, clear questions<br>2. Avoid suggestive questions<br>3. Avoid suggesting answer to one question by a later one |

| TYPE | BEST APPLICATIONS AND PURPOSES | WEAKNESSES | SUGGESTIONS FOR IMPROVEMENT |
|---|---|---|---|
| 9. ESSAY<br><br>Scoring Method<br><br>Usually 5 or 10 points for each question correctly answered; questions are sometimes "weighted"; partial credit usually given | 1. To promote thinking<br>2. To locate writing ability<br>a. Spelling<br>b. Handwriting<br>c. Neatness<br>d. Phraseology | 1. Time required to score<br>2. Lacks objectivity<br>3. Lacks reliability<br>4. Penalizes the non-writer<br>5. Poor coverage of area to be tested | 1. Limit score of question<br>2. Avoid suggestive questions<br>3. Make questions clear and definite<br>4. Require a rough sketch when possible<br>5. Weight question in scoring |
| 10. PERFORMANCE<br><br>Scoring Method<br><br>Usually based on journeyman work standards | 1. To check manipulative skill<br>2. To check safety habits | 1. Difficulty in scoring accurately<br>2. Difficulty in setting up physical conditions | 1. Develop a definite rating procedure<br>2. Be sure learner understands thoroughly |

## Guide to Faculty Performance Appraisal

| Performance Factors | Far Exceeds Job Requirements | Exceeds Job Requirements | Meets Job Requirements | Needs Some Improvements | Does Not Meet Minimum Requirements |
|---|---|---|---|---|---|
| Quality | Leaps tall buildings with a single bound | Must take a running start to leap over tall buildings | Can leap over short buildings only | Crashes into buildings when attempting to jump over them | Cannot recognize buildings at all |
| Timeliness | Is faster than a speeding bullet | Is as fast as a speeding bullet | Not quite as fast as a speeding bullet | Would you believe a slow bullet? | Wounds self with bullets when attempting to shoot |
| Initiative | Is stronger than a locomotive | Is stronger than a bull elephant | Is stronger than a bull | Shoots the bull | Smells like a bull |
| Adaptability | Walks on water consistently | Walks on water in emergencies | Washes with water | Drinks water | Passes water in emergencies |
| Communication | Talks with God | Talks with the angels | Talks to himself | Argues with himself | Loses arguments with himself |

- Author Unknown

# EVALUATION IN THE EDUCATIONAL PROCESS - AN OVERVIEW

Lawrence Borosage[1]

As you can see by the agenda, we are going to be spending some time on the specific areas of faculty evaluation and student evaluation. Therefore, there will be certain aspects of evaluation that we are not going to be dealing with in any depth. As a result of our planning it was decided that I would give you a broad outline of what might be covered with a group of teachers regarding evaluation. This is an overview that you might want to add to when you get back in your own situation.

I would like to attempt to cover three areas of concern. The first is the question, why evaluate? I see about seven reasons why, or seven purposes for evaluation. Then I'd like to discuss three or four principles of evaluation and finally go hurriedly into five areas of program evaluation. These points are listed in a handout you have been given, but I would like to discuss them briefly with you.

From my point of view the chief purpose of evaluation is that of providing what I would call psychological security to the faculty, collectively and individually. This is provided through feedback from student evaluations. I'm not going to elaborate on that because Duane Anderson is going to spend some time talking about this aspect. The second purpose is to validate the total approach to the educational program. Let's take a look at ourselves after a period of time and see whether it's really working or not. We moved into some areas of discussion of this nature this morning in terms of general education, special education and so forth. The third purpose of evaluation I see is to take a look at the content. Is the content which we have included in the program functional from the standpoint of applicability in the on-the-job situation? A fourth reason would be to check out the methodological approaches, or the instructional strategies, that we are using. This seems particularly important when one gets into such things as problem-solving and concept learning. Granted this is a little more difficult than evaluating some of the other kinds and levels of learning that we may deal with, but it seems to me one has to be a little more concerned as to whether the job is getting done.

The fifth purpose has to do with guidance and individual development. Have we really built into the program those kinds of things that we may have stated in our objectives from the standpoint of

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satisfying individual differences, individual needs? Number six, one that is becoming more pressing each day, is the whole matter of public relations. We need more accurate data so that when we are confronted with certain kinds of situations we will have the information available to us which we need. And finally number seven would have to do with the financial resources available to us. Are we using financial resources to the maximum in terms of the objectives that we have established?

There are four principles of evaluation that I would like to talk about briefly. Number one is that evaluation offers its greatest potential if it is a continuous, built-in part of the total training process. This includes long range as well as short term appraisals. I think that this is one of the advantages to utilizing the systems approach. It seems to me that there are controls built in that cause us to monitor the program consistently through each stage of its development. Another principle is that evaluation should be concerned with results rather than the efforts expended. We may say with pride that 100 people have graduated from our program, but if only twenty-five are found to be in work assignments that were comparable to the level of training that they had received it seems that one can raise some questions. One frequently hears reports like, a program was held in which 125 people viewed a number of 35 mm films. This is energy and effort expended, but what result did it have?

The third principle that I would attend to is to be sure the program of evaluation is multi-dimensional. There are many ways in which we can evaluate the same kind of thing rather than to use only one approach and make judgments on that basis. Along with that there is the other aspect of it in that evaluation should be multi-level. One can do some evaluation in the classroom, but there is also a need for evaluation in terms of each course, a curriculum, the total program, the administrative structure and so forth. As a fourth principle I believe that self appraisal is better than outside appraisal; however, I think a combination of both is the best. I always think of the study that was made in institutions of higher education in which department heads of a given field were asked to rate themselves as to where they thought they stood in relation to others in the same field. They found that everybody rated themselves in the top 10 percent.

Going on now, I would like to talk about five areas of program evaluation. The first area has to do with the impact which the program has on the professional field itself. Possibly in the health occupations where there is always a shortage of personnel and the problem may be a little bit different than other occupational fields; I don't know. But when one looks at the impact on the professional field, one has to raise the question of to what extent is there a

degree of stability between the supply and demand of professional, para-professional and others employed in that particular field? Is there an adequate reservoir of talent to meet promotion and expansion needs? To what extent is the consumer satisfied with the services rendered? An interesting fact that I have found here at this institute, in terms of the impact on the professional field, is the need for communication among the various specialized areas.

How does one get some indication of what is happening in terms of the points that I have mentioned? It can be obtained through such things as studies by manpower analysts, personnel studies, interviews, and internal attitude surveys.

Another area of program evaluation has to do with the administrative arrangement. For example, this shows up when I hear some of you state office personnel are a little bit restive and would like to operate more as a separate entity reporting directly to your state director of vocational education instead of operating through a state supervisor. This says that the administrative structure must be getting in the way from the standpoint of your effectiveness. One can raise some questions about the methods that were employed in establishing educational programs. Also there are questions to be asked about the caliber of the staff, the physical setting in which the program exists, and the resources available such as libraries, records, materials, and instructional aids.

What are some of the techniques used to evaluate programs on the criteria that have been established? Frequently, we use an outside and impartial agency or team -- state consultants or teacher educators may fulfill this function. Accrediting agencies, licensure groups, and in some cases, advisory committees to the program may carry out this function.

In area number three, when one looks at the curriculum plan, one can raise a number of questions. What is the philosophical base on which the curriculum was developed? What are the criteria that were used to justify the selection of this occupational training program? What procedures were followed in determining needs, deriving objectives, assessing the input data from the standpoint of students, from the standpoint of finances and so forth.

I'm not going to talk about what to classify under area four because Chuck Porter will be spending a great deal of time on the area of evaluating student progress.

Then the final area, the impact on students subsequent to the formal educational program. In the last analysis, unless one sees changed behavior operative in the on-the-job situation, the formal training program may be seriously challenged. There seems to be three

kinds of concerns that one would attend to in this fifth area. The transfer of instruction into changed behavior on the job, the progress made in meeting the specific objectives of the educational program and the indications of improved efficiency, service and employee satisfaction. How are some of these evaluated? Well, among the techniques which might be used are: (1) asking participants how they benefited at periodic intervals after completion of the formal training program; (2) having participants fill out questionnaires at intervals following the training; (3) attitude surveys; (4) post-training needs can be reviewed with graduates and with consumers; (5) direct observation of participants at their work stations; (6) work performance reviews by the immediate supervisor, if such a practice is in existence in the hospital or in the work station in which the graduate finds himself; and (7) spot checks of the consumers of the service. We may be able to get some pretty valuable information from patients about the graduates of our programs.

In general, these are the five major areas of evaluation that I see as we look at it in its totality. It is much more than just what takes place in the classroom situation. I am going to stop at this point and turn the session over to Duane Anderson who will talk to us more specifically about faculty evaluation.

## FACULTY EVALUATION

Duane Anderson[1]

Most of you know that faculty evaluation is a very popular, very prolific, but perhaps also very unproductive area of research. People have been researching and writing in this area of teacher evaluation for many, many years. Dr. A. S. Barr, at the University of Wisconsin, was one of the well-known researchers in this field. I was his last graduate student though I don't claim any fault for his demise. After twenty-nine years of investigating teacher effectiveness and teacher characteristics, Dr. Barr made statements, both verbally and in print, that he probably knew less about teacher evaluation twenty-nine years after he had started researching this area than he did the first year that he began his work. There is a great deal to be looked at in this area of faculty evaluation and I think it has some relevance to people who are preparing faculty; that should be a very obvious kind of thing. It is the selecting of what to say to people who are to be preparing teachers that causes some concern. While trying to determine how many

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of the thousands of research studies that have been done on faculty evaluation have anything really to say to you, I suppose I felt just a little bit like Elizabeth Taylor's new husband. I knew what to do and I knew how to do it, but I wasn't sure I'd make it interesting for you. That was my dilemma, of course, trying to pick out those things that were pertinent, that would perhaps make it interesting for you, as we look at this problem of faculty evaluation.

Let me say, first of all, that we must look at faculty evaluation in the context of total evaluation; we can't really separate faculty evaluation from student evaluation, or program evaluation. There are many things that cross over these three categories, but we possibly can point up some of the specifics dealing with faculty evaluation and see incidentally how they relate to program evaluation or student evaluation. I won't go into program evaluation in any depth although there are some interesting things in this area.

Norman Harris in his book on occupational education, published by the American Association of Junior Colleges, has a chapter dealing with evaluating the curriculum. I am sure this was taken from someone in California. If I remember the footnote correctly, it says, "taken from a California study done in 1960." You might be interested in going through the questions that he suggests be used to evaluate the occupational program.

Student evaluation is the major topic that we are going to be working on for the next couple days. I think there are some warnings that we ought to consider when dealing with student evaluation. People involved in evaluating students often begin to believe in the tests that they give. It's like an athlete believing his press clippings. They begin to actually believe that what they find out using a particular objective test really describes that individual. Many of us get into this bind after we begin to be testers--we become more testers than teachers--and we begin to think that what we have found on the test is reality. In effect, it is not reality at all. It's something that we have manufactured. There's a little poem dealing with tests that I'd like to read to you.

In a Great Large File

We've a splendid testing system. If you'd like it I shall list 'em
Said the city superintendent with a holy little smile.
We measure kids and test kids to see what things infest kids,
And then repeat the process every little while.

We give grammar tests and hammer tests and also Katzenjammer tests,
And German tests and vermin tests, the best we can compile,

Appreciation, condensation, information lucubration,
To say nothing of vocation - Oh, a tall, tall pile.

Our tests are often mental, but they may be merely dental
Or sometimes environmental (about the domicile).
Versatility and ability, then utility, then debility -
With indefatigability we choose the latest style.

Constitution, restitution, home pollution, destitution,
Go-to-college, moral knowledge - just wait a little while;
Aptitudes and attitudes but seldom the beatitudes
For measurement of platitudes serves only to beguile.

Physiology, sociology, entomology, and geology,
For present-day psychology says these things we should compile;
Metaphorical and clerical, historical, hysterical,
Our tests are quite numerical, and very much worthwhile.

Spelling tests and yelling tests - no, I'm not selling tests,
But schools that seldom use them are very, very vile.
We give our tests, record our tests (I wish we could afford more tests)
And I keep them--keep them--in a great, large file,

Well, oftentimes we run into this problem of continuing to give tests, and not find any reason to use the tests. I think the other problem that I have deals with this idea of reality, and I guess this fits also into faculty evaluation. Also, we have to be extremely careful that we do not become so involved in testing that we forget what we are attempting to accomplish. I know of a young lady who is a nurse and wants to come into the higher education program at this university. She is being refused admission to the higher education doctoral program because of something called the GRE score. I'm not sure there is much relationship between this mark, or these six little marks on the paper which describes this lady in terms of a GRE verb and quantitative score and her potential for being a good teacher in the health occupations field. But as you probably are well aware, we get to that point where we really believe in these tests, they are adopted, rules are set, etc.

I'd like to divide what I have to say in the time that has been alloted me into four questions. I'm not sure that I can provide the answers; I think the answers have to come from you. Perhaps we can get some discussion going anyway. First of all, why evaluate? What is the purpose of faculty evaluation? Secondly, who should evaluate teachers? Third, how should we evaluate teachers? And the last, what should we evaluate? If we can take a look at these, one at a time, perhaps you can come up with the meat that will go on the skeleton that I shall provide.

I've listed five different reasons why we evaluate faculty. Let me go through them. The first one, to employ. We recognize that for many good reasons we have to evaluate people, test people, examine people before we employ them. Some have said that we wouldn't have to carry out any further faculty evaluation activities if we had done an adequate job when we evaluated the candidate for our particular position. Evaluation, faculty evaluation at least, would be over at that particular point. I doubt whether any of us will ever arrive at that point where we have 100 percent accuracy in selecting the persons to become a teacher in our particular area. We just don't know that much about testing or evaluating candidates. We spent some time talking about the value of the interview, the conference, in our small group earlier. Most of you, when you select your potential candidate for the teacher preparation program that you are going to develop will have an interview. You really believe that you can find out something about that teacher in an interview, that you couldn't find out through other means of evaluation, and I don't doubt this in the slightest. If there are some obvious physical characteristics that are required of your teachers; if you need both hands for an orthopedic teacher to operate machinery and a person comes in with only one arm, it is quite obvious that your interview will screen out someone who has a poor chance of succeeding. However, more and more, the statisticians are convincing us that the selection of students for academic programs and perhaps teachers for teacher preparation programs can be done as accurately with a regression equation as you can do with an interview. Maybe this is a point over which we are going to have to have discussion. How important in evaluating faculty for employment purposes are these objective criteria and the material that you can pick up through an interview. If you had a seminar coming up and were going to select 20 teachers to participate in this teacher preparation program and you had 150 or 200 individuals to select from, on what basis would you select potential teachers for both entry into your program and for employment?

The second reason for faculty evaluation is to promote. Perhaps we ought to include in this to retain or to dismiss, because they're pretty closely related kinds of activities. Most of us know that throughout the course of the teacher's experience she goes through a period of retention, promotions, or dismissal - in some cases. These activities are precipitated by someone's evaluation and the sad part of it is that, up to this point at least, it's often gossip, back room stories, someone's biases or prejudices that determine whether or not this teacher is promoted, retained, or dismissed. There is nothing very scientific, nothing very valid in terms of proof or evidence that is used for this purpose.

Then the fourth reason, why we should evaluate, is to reward. This is one way of giving the satisfiers that people need. I hate to use money in this particular case, but if you are in an institution where

merit pay is a part of your policy of faculty reimbursement, you are going to have to come up with some justification for giving Mary merit pay and not giving Sue merit pay, and you'd better have a means of arriving at that particular decision. Of course, there are other kinds of satisfiers. I have worked in institutions where I felt that the administrator made a poor evaluation of the activities of the teachers and actually rewarded those teachers that were not meeting the objectives of the program and of the institution. In doing so he completely demoralized the entire staff by rewarding the wrong people and turned both groups against the institution.

I guess, in the final analysis the primary reason that we should evaluate faculty is for improvement, to provide feedback, to improve instruction. This gets kind of hokey though. I have never seen a report that dealt with the topic of why we evaluate faculty, that I did not contain this reason. Any time that I've ever asked an administrator why they evaluate their faculty, I have been told it is for the improvement of instruction; yet I very seldom find any evidence that the evaluation procedure leads to the improvement of instruction. Whatever they use--check-lists, visitations, or however sophisticated or simple their evaluation procedure is--when you ask the question, "How do you use that evidence in improving instruction?" Seldom do you find any implementation. Very seldom can they say, "This is the way we gather the information and this is the way we improve instruction with that data."

Well, jumping then to the second step, we have the whole area of who will evaluate the faculty. Faculty are extremely sensitive to the whole process of evaluation. Just this summer we held a workshop dealing with faculty evaluation in the community college setting and maybe I can use some of the things that were said as input to this discussion. Many said that people who come out of the occupations are less sensitive to evaluation than those from the academic setting. Maybe your job will be a little easier because they said that these people are accustomed to being evaluated. They may have been referring more to the industrial technician, but perhaps that's true also in the health field. We know of course about professional prerogatives. When I close that door in University Hall, nobody, but nobody comes in to evaluate me. This is the thing that we have to overcome in our community colleges at least, where we talk about teaching as being our reason for being. Traditionally at the university, nobody evaluates the faculty in his teaching situation. They may evaluate his research reports, but nobody evaluates his teaching. In fact, it is almost a cardinal sin in most universities to suggest that we should be doing any kind of formal evaluation of instruction. Now everybody knows that evaluation is going on. It's going on by those people sitting there receiving the instruction. The students are now beginning to formalize their evaluation procedures. As many of you know, the "blue-book" system is going around the country; we have one here. It's not very

well organized at this point, but I understand at the University of Illinois and Michigan State, it is a quite well-organized booklet. The students themselves evaluate the faculty and then publish the results, sometime humorously, but there's a great deal of pressure put on by these blue-books that students publish describing the effectiveness of certain faculty members. Students have always evaluated the faculty. Everyone of you remembers asking someone else, "How about Joe Smith in chemistry?" And they gave you a complete rundown. They evaluated that man right down to his mannerisms, speech, how difficult a grader he was. They probably do an excellent job; much better perhaps than any other outside evaluator could do.

Well, who should evaluate? I have listed four different groups that you might consider. You are probably some of these people. First of all, let's talk about supervisors. And here we could spend a great deal of time. Which supervisor? Should it be the health occupations educator? Should it be this supervisor? Should it be the vocational-technical dean, at that level? Should it be the dean of instruction? Heaven forbid, the president of the college! What supervisor should evaluate you as a teacher? Now, we could argue this back and forth. And there is no answer, but we certainly know that supervisors do evaluate faculty. The peer group is a second alternative. This again is probably easier in your field where you may have some opportunity to be in another faculty member's classroom. We don't at the university. We very seldom do this in academic areas at the community college. How many times have you sat in as a teacher on another teacher's classroom? I think this would be a very appropriate group of people to evaluate the instructional procedure but very seldom do we have the opportunity to do it.

And then a third group and one we talked about earlier, the students. This is an effective group to evaluate faculty performance and much has been written about how to use students' ratings of faculty to improve instruction. There are problems that are raised. Are the students capable of making an evaluation? How do you word, or structure these student evaluations so that you get truthful answers? You also might get much more truthful answers than you are willing to accept. More and more students are becoming very honest and will tell you very quickly what they think of your instruction if you give the opportunity. One of the people in our workshop indicated that he used student evaluations. When we prodded him a little further, we found that he had them evaluate his course and then he graded it for their final grade. He told us that he didn't really care what they said, he just graded it for the way it was said. Well, I don't think the kids are that stupid these days; they knew that he wasn't just looking at the composition of that evaluation, but also the meanings that were there.

A fourth group of people who perhaps should evaluate are outsiders. So-called experts, licensure boards, accrediting agencies, certifying people who come in from an outside situation and evaluate the teaching effectiveness. The degree to which we use this group at the present time is extremely small. We keep saying over and over again, we are different; they don't understand what we are doing. I wonder how many of you would like to have the dean of our medical school come in and evaluate your operating room technician in her teaching situation? I wonder how many of you would like to have the head of your mathematics department come in and evaluate one of your radiology teachers? How many of you would like to have me come in and evaluate you in your teaching situation? We can see that outsiders pose a problem and we are going to have to structure this if we are going to use outsiders as evaluators.

The person who knows best what is going on, of course, is the individual himself. If we really can develop in people some method of insight so that while they are teaching, they can sit back and take a look at what they are doing, we may have something. This videotape machine is going to help us do that. Since you can go back and see what you did during some period of time, this self-evaluation probably will be the most effective type of evaluation that we can get into.

Well, moving on then to my fourth question, how shall we evaluate? Again I've listed a number of different ways of evaluating. The first one, the one we've always used--and we are becoming more sophisticated--is by observation. There are different ways of observing. The participant-observer. The anthropologist is an example of this. As an anthropologist, he goes in and lives with a particular group of people whose culture he is attempting to evaluate. As a participant-observer he can make some judgment values about that particular activity. It is possible that we can use even more sophisticated forms of participant-observers in the classroom. The old observer picture is the supervisor coming in with clipboard and check-list and standing there and going click, click, click, click. A specific example might be in the military service schools, some of them at least, where there isn't any question about the instructor's "rights," his academic freedom. In that particular setting, there isn't any doubt that the observer has the authority to do so. Look up on his shoulder and there the authority is, staring right at you. Now, this doesn't always hold true in your situation. You may lack the authority to go in there and run this check-list type of thing. The specimen record is another way of observing, and a fairly good way. You ask the teacher to give you samples of lesson planning, objectives for the day, a test that she uses, and you can compile a fairly reasonable bit of evidence as to teacher effectiveness. What are some of the other ways of observing? We've already mentioned the videotape recording method. You can use objective measures of evaluating teacher effectiveness. Achievement tests, for both students and teachers. If you want to know how well your teacher

knows the material, you may decide to give that teacher an achievement test, a questionnaire, a projective test. Can we screen out the teacher who is teaching to satisfy a pathological need on her part to really dominate people? Is it possible to evaluate that teacher through some kind of projective test? I don't know if the Rorschach would do it or not, but something similar to this. Certainly, there are many emotionally crippled teachers teaching in our educational system. I have visited a number of them, even in kindergarten where they were satisfying a real basic need that they had, and the students be damned.

Another way of evaluating is that of using rating forms. There are literally thousands of rating forms that can be used to evaluate teacher effectiveness and competency. Self-reports, the open-end kind of question asking the teacher to evaluate herself and turning in some kind of self-report. They are using this for merit pay in many institutions. They ask you to do this, to identify your objectives, to evaluate yourself. We will be asking you to rate yourself at the end of this institute. Existing records are another way of evaluating teacher effectiveness. We don't use them too often. All the information we collect from teachers is generally filed away some place and is never used in the evaluative procedure.

There are other ways to evaluate, but that's probably enough on that area for now. I'll get to this last segment here, which is where we run into trouble. Most of us would agree that we are going to evaluate; that a number of people are going to be involved in the evaluative process; that we are going to use a number of techniques, a number of methods; but when we ask the final question, we run into trouble. <u>What</u> do we evaluate? What criteria do we establish if we are going to evaluate? We can't use a rubber yardstick. Unless you know what it is that you want to measure, it's awfully difficult to measure it. I think the first problem that we have in this area of what do we evaluate is that we have no hierarchy. We haven't established a hierarchy, similar to the one Jake Stern talked to us about in the objective area. We get caught in being way up in that highest social objective, high social value so often that we end up with the meaningless statement that good teachers are "good people." If you want a good teacher, you have to have a good person. Well, that doesn't tell us anything. We have to get down to some level of specificity if we want to evaluate the effectiveness, or the competency of teachers.

The second thing that I want to talk about in this area deals with a kind of dichotomy that we talked about in one of our small groups. We talked about the difference between evaluating teacher competency and teacher effectiveness. Some of the people didn't quite agree that there is a difference. Some said, "You said it, but I still don't believe it." Is it possible for a competent teacher to be ineffective? I think we finally agreed that it was. You can have a competent teacher who is very ineffective. So then the question is, are you

measuring teacher competency, are you measuring teacher effectiveness, or are you measuring both? Can you know when you go to evaluate the faculty member whether you are measuring competency--and maybe I should use another term now which is easier for me, performance--or are you measuring effectiveness? Can we have a teacher who would fail to be able to teach students anything and yet be an extremely competent teacher? I think that possibly we can. A number of studies have been made trying to give us the answer. The Ryans study, is a huge study of teacher characteristics. They looked at 6,000 teachers in 1700 schools and ended up with some patterns which were used to describe the "good teacher," "the competent teacher." They ended up with 10 such patterns. A series of codes were used, to make it more impressive. The X-pattern was "warm, understanding, and friendly," versus the "egocentric and restricted teacher behavior." That's one kind of dimension that we use to study teachers, the warm, understanding, friendly, versus the egocentric and restricted teacher. A Y-factor was "responsible, businesslike and systematic" versus "evading, unplanned and slipshod." Another one, "stimulating and imaginative" versus "dull and routine." "Favorable versus unfavorable." "Opinion of pupils" was a characteristic that differentiated the good teacher from the bad teacher. "Favorable versus unfavorable opinions of the democratic classroom procedures," "favorable versus unfavorable opinions of administrative and other school personnel" were included. Here's an interesting one. "Learning centered versus child centered educational viewpoint." "Superior verbal understanding versus poor verbal understanding." "Emotional stability versus instability." Those are some of the kinds of things that came out of this Ryans Report.

I suppose we are looking finally for what we would identify as the ultimate criteria for evaluating faculty, and a number of things have been identified as the ultimate criteria. There appears to be a consensus developing and the reason I'm hard put to express it is because I don't believe in it yet. Many say that the ultimate criterion is student behavior; that if we want to evaluate, if we want to identify the effective teacher, we will identify that teacher that can effect changes in student behavior. And yet, I can't believe that we can throw out entirely some of these other areas, the faculty, the teacher behavior, the teacher as a person, to me seems also to be an important part of what we are looking for in a particular teacher. I think we are looking for the person who is willing to serve as a model. We talked about that a little bit today. One of the dimensions that we threw around this morning, this idea of general education, having the proper mix of specific, technical, related and general education may be important here. If I were going to select a good vocational education teacher one part of my evaluation would consist of what kind of a person that person is and how much being what he or she is helps students to be willing to accept general education concepts. I don't think you always have to teach general education concepts in a formal

lecture, in a formal course. This is basically what we tried to throw out a little bit this morning. It's who you are, what you are, what you believe in, what you are willing to stand up and preach, I guess, that maybe determines what your feelings are about general education and your effectiveness in getting across general education concepts. Here is a little thing which may say this in a little better way.

I

"I'd rather see a sermon
Than hear one any day;
I'd rather one should walk with me
Than merely show the way.
The eye's a better pupil,
And more willing than the ear;

Fine counsel is confusing,
But example's always clear.
And best of all the preachers
Are the men who live their creeds;
For to see good put in action
Is what everybody needs."

II

"I soon can learn to do it,
If you'll let me see it done;
I can see your hands in action,
But your tongue too fast may run.
And the lectures you deliver
May be very fine and true,

But I'd rather get my lesson
By observing what you do.
For I may understand you
And the high advice you give,
But there's no misunderstanding
How you act and how you live!"

Maybe this is the real way to get general education. I think we'd better be careful about accepting this ultimate criteria for evaluating teachers. We'd better be careful that we do not get the teacher who is evaluated only on her ability to produce some kinds of behavioral changes in students. I'm playing somewhat the "devil's advocate" and do expect you to come back to this just like on some other areas.

Now to summarize the lecture part of this presentation. I hope this will then lead to some discussion. There have been a number of attempts to arrive at ultimate criteria of faculty performance, or faculty effectiveness. Tommy Tomlinson came up with one that I thought was extremely good. He said that we should evaluate people in terms of their quality, timeliness, initiative, adaptability and communication factors. This sounded very good. There seemed to be pretty valuable characteristics that one could use in evaluating faculty. It appeared that we needed a rating scale. So we went across the scale and we marked it off into five sections. The highest rating on each of the characteristics was stated as, "far exceeds the job requirements," the next highest as, "exceeds job requirements," then "meets job requirements," followed by "needs some improvements," and finally as, "does not meet minimum requirements." It sounded real, real good, but then performance criteria was required to accurately determine the individuals placement. So the man who far exceeds the job requirements in terms of quality must "leap tall building with a single bound." It goes on then with, "must take a running start to leap over tall buildings," "can leap over short buildings only," "crashes into buildings when attempting to jump over them," and finally, "cannot recognize buildings at all." Let me just give you two others. There is an interesting one under initiative. "Is stronger than a locomotive," "is stronger than a bull elephant," "is stronger than a bull," "shoots the bull," and "smells like a bull." And finally the adaptability criteria. If he far exceeds the job requirements, "he walks on water consistently"; if he only exceeds the job requirement, "he walks on water only in an emergency"; if he meets the job requirement, "he washes with water"; if he needs some improvement, "he drinks water"; and if he does not meet the minimum requirement, "he passes water in an emergency."

We certainly have a big job to do in this area of faculty evaluation and there are a lot of problems to be solved. Oftentimes we create a tremendous number of problems when we begin to even touch on the subject of evaluating faculty, and yet can we afford not to? Can we afford to talk to people about developing educational objectives, provide them with media, go through all these tremendously expensive and time-consuming activities and then not know whether or not we have a better product. I know we like to hide behind such things as: "It's an art, folks, not a science," "my teaching cannot be evaluated because you just don't understand what it is I am attempting to do." I don't think we can afford that. I think we are going to have to reach the point where we can evaluate teaching, but we must know what it is that we want. We have to establish some criteria, and then we can go backward and identify who should do it and how it should be done. But until we establish our criteria, we are in difficulty.

(Editor's note: The discussion which followed the more formal part of this presentation was lively and lengthy. It has been necessary to edit the discussion to make it readable and to reduce the length.)

I've been in quite a variety of institutions and have never heard people talk too much about differences in evaluating faculty performance in these various institutions. Possibly a teacher teaching somewhat the same kind of thing might be evaluated differently in these different institutions. It's just a thought at least. Is there a difference between instruction in a vocational school and the instruction in a community college, between the instruction in a community college and the instruction in a university, or between the instruction in a hospital and the instruction in a community college? Does the (nomothetic?) dimension affect teacher behavior as I know it affects administrative behavior? I know a little bit more about administrative behavior than teacher behavior, but I have a feeling that the context in which you teach may in some way affect the way you teach.

(Participant: "One of the problems in measuring teachers based on the behavior of students is that we don't always know where they were when we started. We may have one person down here and another up here when we begin and yet the teacher may get full credit for moving them the same distance.")

Are the steps between here and here the same as the steps between here and here? On any measuring device, is it easier to bring a person from no knowledge, zero, to some certain level, a certain amount of information? Is it easier to do that than to take this person who has a tremendous amount of information and hone him to that expertise kind of position?

(Participant: "Some of the people that I've talked with, when we look at teacher behavior, are looking at the person like they are good, bad, indifferent, whatever. If we look at teaching behavior I may do one thing very well and another thing very poorly. Maybe in some things I'm effective and in others I'm not. Can we look at the particular thing, the particular improvement, maybe I don't have to improve in all areas.")

Typically, the rating scale covers three, four or perhaps five major areas. The one I happen to have here covers four different areas. Let's take a look at these. Classroom teaching is one of the areas. Scholarly and professional performance, college and public service, and personal attributes. Let me ask this question. Should we evaluate the personality of the person?

(Participant: "I may be wrong, but I believe that in the Ryans study you quoted earlier the most often mentioned criterion was "warm, understanding, and friendly."

(Participant: "I agree that it would be awful to have a teacher without "personality" because it would make learning awfully dull.")

Can you examine your personality? Your teaching personality? Do you have a teaching style? Should you evaluate teachers on their teaching style? Can teachers evaluate teachers? Is it within the realm of possibility? Are you free enough, or are you in a competitive situation where you can't afford to evaluate?

(Participant: "Our faculty association is having negotiations with our board of governors. The association would like to elect a group of faculty members who will evaluate the faculty with their primary purpose as the improvement of instruction. These teachers would have released time, paid by the college, for these duties.")

(Participant: "For about six years, I've been involved in this "peer evaluation" pattern having served on an ethics and grievance committee of the Illinois State Medical Society. As you might imagine, it gets a bit tacky at times. I would say that it is impossible for any of us on such a committee to completely divorce our personality from it, and I feel that once you get personality involved in it you invalidate a certain part of that "peer evaluation." I would like to see it changed in the medical profession. You do not have it in the teaching profession and as a physician I would suggest that you don't.")

I'm concerned again because we are dealing here now with training teachers. You are not going to be evaluating the nurse, you are going to be evaluating the nurse-educator.

If we are going to evaluate teachers, we are going to have to have criteria for teaching. We can't evaluate teaching if the criteria we select is nursing. Is the best athlete necessarily the best coach? I don't think we have separated this in the nursing field. By the way, I've been told to stay away from this controversy. I think we have said "good nurse - good teacher." There is a different set of criteria though. Do you know what a good nurse is? Do you know what a good nurse educator is?

(Participant: "I would like to go back to the community college which is asking to establish a policy where a group of faculty members will evaluate the faculty and ask, who is going to receive the results of the evaluation? Will it just be the individual evaluated or will others be involved?")

(Participant: "This proposed policy is a reaction to the present system in which the deans do the evaluating. We haven't established as yet who will get copies, only the primary purpose is faculty improvement.")

As a member of that faculty committee I will say one thing if only the faculty member will see it, but something else if the administration will see it. So it does make considerable difference.

(Participant: "I'm breaking my neck to get peers to evaluate peers so that somebody who knows what is supposed to be going on will be doing the evaluation rather than an outsider.")

(Participant: "Would not evaluation be more valid if we have inputs from more than a single source. I'd like to see peer ratings as only one source of evaluation.")

Lawrence Borosage: Let me just cite two sources that you may want to investigate. The assistant superintendent at Cincinnati, Ohio became very much concerned about this whole problem of teacher evaluation and became intrigued with what industry was doing from the standpoint of what they called work performance review. So he got a group of industrialists together and he said, "Look there must be some way in which we can evaluate teachers that's comparable to what you are doing in industry." The resultant product was a little pamphlet called "Evaluating Teacher Performance." One component of this evaluation is that the administrator sits down with the teacher and they decide what the objectives that the teacher is going to try to achieve with this group of children this year. Then at the end of the year, they use certain devices to find out to what extent these objectives have been achieved. Another component is the extent to which this reader gets involved in faculty activities, such as curriculum development. A part of this is a peer evaluation. A third component is one that has to do with community service. The individual's involvement with parents, etc., and finally his professional outlook. With this, we get away from this trait idea and you begin to take a look at what we've been talking about in terms of objectives and the extent to which the objectives have been achieved, but more important than anything else is the fact that the administrator and the teacher get together and sit down and they communicate. This is what I think is of greater importance.

The other citation I want to mention is also on the objectives notion. A formulation has come out in a book called Supervision: A Synthesis of Thought and Action, by Lucio and MacNeil. These are two people who are now struggling to use objectives as a basis for determining effectiveness of performance rather than any of the conventional things we used in the past.

Robert M. Tomlinson: As part of a two-week institute held two years for teachers of medical laboratory programs, it was suggested that surely there is a better way of evaluating institutes and output than the typical participant reaction. So we hired Educational Testing Service (ETS), who are a professionally recognized organization to perform this for us. We had a little difficulty in getting them to get the feel of what we were trying to accomplish. After spending significant monies to have them carry out a parallel evaluation--phone call contacts, interview prior to attendance, again after attendance,

and so forth--they came up with basically the same results as the staff had with their more traditional evaluation measures. So, in this sense, you might say this was a waste of money. There was though the value in finding that someone from the outside does come up with similar results.

There are a couple of things from this discussion that I would like to comment on. In terms of selection, it has been found in industry or any place else that if you use a series of test patterns, or whatever, and then you correlate or check this with your success criteria, that over time you will develop the ability to become relatively accurate in predicting success in your program or institution. But if you move that same pattern to any other situation, it will be less effective. One of the main reasons for this is that we don't very often know what it is that these items measure, and it really doesn't make any difference so long as it is related to your success criterion. So it may be the personality of the faculty, it may be the personality of the supervisors, it may be that the teachers just don't like redheads, and this happens in programs. So whatever it is you have a self-adjusting, self-validating system. But I would caution you to say why. It may not be because of those things you think you are measuring.

The other point I'd like to mention is more directly related to the supervision of instruction. I'd like to recommend that this be set up on a known regular schedule. This is important, because if it is on a known and regular schedule, then it would precipitate the kind of communication between supervisor, faculty, or faculty groups that we need. Everyone knows it's coming. Then they have the opportunity to sit down and discuss, without the situation being loaded with tension. If you can set up a schedule, then the structure itself can draw off some of the tension. I would go further to say make out the evaluation together. Once anyone has committed himself to a rating form, written document, then immediately the possibility of negotiating, finding a mutual ground for communication and improvement is gone. Let the structure work for you.

One more point. Once it has been established that there is need for some type of improvement the responsibility of the supervision does not end. The supervisor should take some responsibility for assisting the faculty member to make the needed improvement.

(Participant: "Some of you might be interested in a film entitled 'How Good is a Good Guy' which is on the theme that every person in the work environment needs to know how they are doing. It is an excellent film and is available through such agencies as the Audiovisual Center here at the University of Iowa.")

Anderson: We are going to evaluate teaching to some degree, hopefully in a non-threatening atmosphere when we look at your micro-presentation. We are not going to evaluate your knowledge, your subject

matter ability, but we are going to be concentrating, I suppose, on your teaching ability, your teaching style, your teaching technique, your effectiveness as a teacher. You may never have been evaluated on that set of criteria before and maybe this will be the time to bring up some of these other problems of who should evaluate and really what criteria should be used. What is a valid criteria for evaluating teacher effectiveness? How you look, how you motivate? You see, the problem is that we can't evaluate competency directly. You have to evaluate competency by inferred behavior. So, we are kind of tied up in this thing in trying to decide whether we want to evaluate how competent a teacher is or evaluate how effective a teacher is. What criteria will you use?

## WRITING CLASSROOM TESTS

Charles Porter[1]

There are two parts to this area of student evaluation for which I'm responsible. This afternoon, I will get into the nuts and bolts of item writing then tomorrow morning we'll get to this matter of reporting scores and so on. Coming into the middle of an institute like this I sense that the educators have already gotten to you. Right off I noticed health-types spouting phrases like "frame of reference," "educational strategies," and so forth. So you fellows have been effective, I only hope you haven't ruined them.

I was interested to find out what kind of group I was dealing with, because it makes a difference to me in terms of what I have to say. If you were a roomful of teachers who had come to a professional education program, a lot that I would have to say would be most inappropriate for you would have heard it before. An interesting thing is that you wouldn't have heard it in your undergraduate education program, but rather in your master's program. This is a big puzzle to me. One of the most important aspects of the teacher education program, the assessment of achievement on the part of our students, is typically left out of undergraduate teacher education programs.

One of the things that you need to learn is that you take your students where you find them. One way to find out where your students are is to give them a pre-test, so I have developed a speeded pre-test that I'd like to administer. Do you know the difference between a

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speeded test and a power test? A speeded test is timed and is designed to put the group under controlled stress. The theory is that you learn more under pressure.

(Editor's note: At this point a short "fun type" test was given and some visuals were used to make the point described below.)

One of the problems that we have in evaluating student achievement is that we are not always sure of what we are evaluating. We think we have given clear, precise directions but somehow things don't come out the way we planned them. The preceeding activities were designed to make this point. They illustrate a term in test and measurement, that you may want to remember. Test validity--the degree to which a test actually measures what it purports to measure. Sometimes we get artifacts that enter into the testing process that give you results other than what you had intended or predicted ahead of time.

In his introductory remarks Larry Borosage indicated that testing does not occur apart from the total educational picture. Too often, I'm afraid, we do think of tests as being something quite apart from the educational experience. There is a little analogy that I think is useful in thinking about testing and tests. It's what I call the trip analogy. We have three main parameters to a successful trip and they are all interrelated. You can't goof one without goofing them all. They are destination, transportation and navigation. If we are planning a trip we usually think in terms of where it is we are going and select our transportation in terms of that destination. If we are going to go to a foreign country we will probably rule out riding a bicycle as a mode of transportation. It's inappropriate, you see, for that destination. There are a number of alternatives, however. You could go by boat or by airplane. The method which we select determines, to some degree, the navigation system that we use. So our navigation system is selected in terms of the transportation, but it is also keyed to the destination. This is the function of a navigation system, to permit you to assess your progress towards your destination. Let's say you live in Bloomington, Illinois and decide to go to St. Louis. As you drive along you see a sign indicating that Pontiac is 15 miles away. You go a little further and see a sign that says, Odell 12 miles. From this you identify that you're going the wrong direction. Your navigation system--your roadmap--shows that as you go north out of Burlington, you run into Pontiac and Odell, when you really should be going through McLean and Atlanta on the way to St. Louis. So the navigation system is selected to be appropriate for the transportation system and is constantly checking our destination.

In the educational trip, your destination is what we refer to as objectives, your transportation is the content, and the navigation system is an evaluation program of some kind. Now, this has all been hashed over for you this past week, and perhaps it was said with

fancier terminology; but essentially objectives are determined, and then the content is selected in terms of the objectives. Presumably the content is the medium through which the student achieves the objectives as he participates in the learning situation. The evaluation program is designed to be appropriate for the content, but it is constantly aimed at the objectives. Now, this may be an over-simplification but it is a useful kind of over-simplification, because I believe it shows these three important elements of the teaching-learning situation in a realistic and meaningful relationship.

In the evaluation systems frequently we think only of paper and pencil tests, but they aren't the only medium we might use for educational evaluation. There are other means--performance tests and the like--that are often appropriate. The appropriateness is determined in terms of what constitutes the content and in terms of the objectives to be achieved.

We run the risk sometimes of falling victim to what I call the mathematical procedure syndrome. Simply because we attach numbers or assign numerical values to things, we immediately assume that we are dealing with a degree of precision when the truth of the matter is that we are not. For example, I could say that an apple is a three, a banana is a two, and a pear is a one. O.K., I have equated the digit three with apples, the digit two with bananas and the digit one with pears. I add the three of them up and it comes to six, and I find the average of that, which is two. I then conclude that if you take an apple, a banana and a pear and you average them you will come out with a banana every time. Well the numbers are there! And who can dispute numbers? I think we have to remember that we are dealing with a very complex variable when you are trying to measure things, attributes about them, and beings. Tests, paper and pencil tests, are very crude instruments to use in measuring some of these very complex variables. So we must use a little human judgment in our evaluation program. We have to make darn sure that in our evaluation procedures that we are ruling out as many artifacts as possible. By artifacts I mean those things that creep into evaluation that don't have a thing to do with the outcome we are trying to measure.

In a discussion this afternoon, Duane Anderson mentioned something about the climate for faculty evaluation. The climate for student evaluation is just as critical. I suspect all of us have at one time or another, gone into a test when we knew the material and yet somehow stupidity set in and we were lucky to get our names on the paper let alone perform properly on the test. For some reason, there is sometimes something threatening about the situation and threatening situations introduce a variable into the measurement that influences the outcome, they destroy its validity. Here is a technique that I have frequently used that seems to work well in reducing the threatening atmosphere of a testing situation. I tell the students that I recognize that we

are not always up to snuff, either psychologically or physically, every day and there may be a day when they will come in and not feel well. So I give them the option of throwing out any one of the tests that's given during the semester. I think this helps to set a better climate. So, the climate is important in giving a test.

Another factor that I think is important is that too often we give only one exam. This doesn't give you a very good sample. Suppose that I gave you a spelling test that had only one word. If you happened to be able to spell that word, you would be, on the basis of this test, an excellent speller. If you didn't happen to know that word, you'd be a miserable failure as a speller. So, in order to increase the reliability of a test we make it longer. Reliability means that the test will tend to yield the same results with essentially the same kind of population time after time. With the spelling test if we add ten more words to it and bring it up to eleven, the chances are that you will know some of the words. Then you won't be in the dichotomy of either being an excellent speller or a miserable speller.

Let me talk a little bit about direct and indirect measurement. In the physical world we frequently are able to make essentially direct measurements, measurements of length, width, size and so forth. However, there are times when we have things that we want to measure that we cannot measure directly. Velocity is an example of this. The speedometer on your car doesn't really measure miles per hour. It's measuring something else, but that something else is related to velocity. As a matter of fact, it is what we might call an indirect-indirect measuring device because it's measuring two things that are related to miles per hour. The first thing is the rate of rotation of the propeller shaft connecting the engine to the differential, and secondly the rate of induction of eddy currents in a little aluminum cup that is spring-loaded. As the propeller shaft turns, it spins a little magnet in front of the aluminum cup and induces an eddy current which reacts against the magnet and causes that cup to want to rotate, but it is trying to rotate against a spring. The faster the magnet turns, the greater the displacement the greater the rotation. If you calibrate that in miles per hour, you can go from propeller shaft speed to eddy current intensity to miles per hour. Since we know that propeller shaft speed is directly related to velocity it's a very valid kind of measuring instrument. With educational type measurement it's not quite as easy as all that. We state certain objectives and want to measure the attainment of these things; like love of mother, flag, country. How do you directly measure love of mother, flag, country? You don't. You must make some inferences about what kinds of measurable characteristics a person who has love for mother, flag and country would exhibit, and then you measure those. If you have been precise in the operational statement of the objectives, then you can probably develop a valid test.

Let's say we have a class of medical technicians and we want to measure what they know about being medical technicians, or some aspect of their occupation. We have a couple of alternatives. One is to very carefully spell out everything that a medical technician ought to know and then ask all of these things. The result of this might be an examination that was so long that it would be virtually impossible to administer. Testing then must become a sampling technique, where we select items which we think are representative of the body of knowledge that we hope that our students have achieved. If they score well on the sample, we conclude that they know the rest of the material. The degree to which the sample questions truly represent the body of knowledge is the degree to which the test is valid. We can never be absolutely sure when we are developing test items that they actually fall within this body of knowledge. Maybe this is what separates the professional teacher from the man on the street. A professional teacher is more likely to pick items which fall within the boundaries of the discipline. Validity is an important concept as far as testing is concerned.

There are purposes for giving achievement tests to students that are kind of a microscopic view of some of the things that Larry was talking about in his introduction. The most obvious is assessing the student's progress. This is the one that we usually think of when we think of giving tests. Less obvious to some teachers is that it is also a device for evaluating teaching effectiveness. I have been in situations where the whole class did poorly on a test and the teacher took the position that the students were a bunch of dummies. I think equally important alternates were that either the teaching wasn't very good or the test was no good. I'm usually suspicious that I didn't do a good job as a teacher if I give a test and the whole class does poorly. If the students know you think this way it is useful for them in terms of providing the proper atmosphere for learning. Whatever is good for learning is also good for testing, and there cannot be a threatening atmosphere.

Another use for testing, apart from assessing student progress and also related to it, is for purposes of diagnosis. This diagnosis can be for the benefit of the students as well as the teacher. Some kinds of information are very orderly in terms of what must precede something else. For example in mathematics we usually don't start with differential equations and work down to arithmetic; it's usually the other way around. Full comprehension of one concept is a function of full comprehension of something that preceeded it. One way to find out whether your class is going along with you is frequent quizzes or tests. Those are three important purposes in testing; there are others mentioned in the textbooks. Incidentally, this little packet from Educational Testing Service on evaluation that you have been given is excellent. Also, I recommend very highly to you the book by Norman Gronlund. Most of the things that I am going to be talking about this

afternoon are mentioned in that packet and the book. Maybe I'll set up some thoughts here for you that will cause lights to come on as you read through these materials.

O.K., what makes a good test? There are a number of things. The first one, of course, is validity--the degree to which the test actually measures what it purports to measure. There is a way that you can compute a coefficient of validity, but unless you are going to be a professional in tests and measurements, I wouldn't bother with it. Reliability as we mentioned is a characteristic of a test that relates to whether you get essentially the same results with the same population with subsequent administrations of the test. A third important characteristic of a good test is objectivity. By this I mean it is fair to all students. This has been one of the criticisms of the so-called intelligence tests. It is said they are culturally unfair, which they are. You can have an achievement test that is culturally unfair, too. Allison Davis at the University of Chicago has done quite a bit of work on the so-called culture-free intelligence tests. If you've never seen one of these, you might take a look at one; it's very interesting. Objectivity then is another desirable quality of good tests. It's fair to all students; it doesn't use unusual words that only a part of the class know because of their particular cultural background. The test should have the ability to discriminate; to separate the good student from the poor student. A good test must be comprehensive. It should sample appropriately from all subject matter covered.

There are some principles of test construction or guidelines that, if you follow them, are helpful in developing reasonably good teacher-made tests. They will tend to keep the test in the proper context of content and objectives. Too often, tests are totally unrelated to the learning situation. I know I've been in situations taking tests and wondered if I was in the wrong room or something.

The first step in developing a test is to list the objectives of your course, or your learning units, whatever it might be. I think probably in the health fields, as in others that tend to be job-oriented, this may be a little easier task than in fields like philosophy. That area is a little more nebulous and abstract. You can't grab ahold of it like you can a hypodermic. For many of the aspects of the kinds of teaching that you people will be responsible for, you know what the guy has to do, so it's easier if you list the objectives for the course, or the instructional unit. However, even with occupationally oriented programs, there are some abstract qualities that border very much on the same level as love of mother, flag and country. So after you have elucidated your objectives, then you should restate them in operational terms. I remember one objective in Industrial Arts that was popular for so long, and they still use it--interest in industry.

Now what does that really mean? Well, when you answer that question, what does interest in industry mean, and develop a series of statements that describe a student who has achieved the objective of interest in industry, then you're ready to test on it. It's when you get to the level where you can spell out the measurable aspects of this objective that you come close to guaranteeing that any items developed that purport to measure the achievement of this objective will be valid.

Next, you construct two or three test items for each of the objectives that you've stated. A scheme that is frequently used, and I recommend it very highly, is to use a separate card for each test item. Allow enough space on the card so that you can add information about the item such as the results of item analysis. I'll describe that process later. Then, administer the test to a representative group. After you've administered the test, perform an item analysis. If you revise the items that are obviously not doing the job, eventually you will find that you can build up a card file of test items by subject areas which will allow you to assemble a highly valid test. This is a procedure that is widely accepted in educational circles.

I understand that most of you have been teaching and have had some experiences with tests. You probably know that one of the most useful objective test items is the multiple-choice or "multiple-guess" type. There are about five variations of the multiple-choice test. Multiple-choice items consist of a stem, which is usually a statement of a problem or a situation, followed by four or five items, of which one is the answer and the other three of four are called distractors or foils. In a good multiple-choice item, the idea is to provide plausible distractors so they will attract those who really don't know the answer.

(Editor's note: At this point an example was shown to demonstrate the components of a good multiple-choice test item.)

There is another kind of multiple-choice item where you have several answers, anyone of them might be correct, but there is one that is <u>better</u> than any of the rest. Another kind is a variation of the matching test it's called an association test. For example, you have the word ignite, and then a list of four additional words, with instruction to pick out the one that is most closely related to ignite. A variation of the multiple-choice item is the analogy type. Something is to something else as something is to something else. For example, you could have Edison is to electricity as blank is to printing. Blank is obviously Gutenberg which would be selected from a list of names.

Why have these kinds of variations? Well, one artifact that can enter into a testing situation and upset validity is boredom. So you mix up the plays a bit, give a little variety to the kinds of items that you use which makes the test a little more interesting to take. This may sound like a picky point, but it's an important one.

Do you know the advantages of a multiple-choice test? It provides a means by which you can objectively score a student's ability to interpret, discriminate, select and apply. You can set up problems, things that require recall, situations where they have to make associations, and so on.

Typically professional test companies prefer to have five-foil multiple-choice items. One time several years ago, I was asked by the SRA Company to write some test items for a national test in connection with vocational education. They said they'd pay me five dollars per item and they wanted a maximum of twenty items. I figured that would be some easy money! Well, I never worked so hard in my entire life trying to come up with twenty items that would meet their standards with five plausible foils. I kept track of my time and when it was all over I had been working for thirteen cents an hour! So, good multiple-choice items are not easy to make. One of the things that makes them tough is having plausible foils. If you have a five-foil item with a couple of foils that are just obviously not related to the stem, then you actually only have a three-foil item.

You will recall that earlier I spoke of doing an item analysis. This is probably one of the most important things that teachers can do to improve tests. You can learn to do this from almost any test construction book; it's quite simple, so I will talk about the process in general terms. There are several procedures used in the process of item-analysis. These include obtaining an estimate of item difficulty, an estimate of the discrimination power of an item and determining the effectiveness of the distractors. For an item to be doing its job it should have a positive discrimination value. This means that, for the most part, the students doing well on the test get the item right and those who do not do well on the test do not. When the reverse is true, the better students tend to get the item wrong, then something is leading them astray and the item should not be used again, or should be revised.

Another kind of analysis that you should make with multiple-choice items is to take a look at the foils to see who's answering the other foils. For example, we have foils a, b, c, d and e. Let's suppose now that a is the correct answer. Say that twelve of the high scoring group chose a and five of the low group chose a. This is the trend that we want to see, more of the high group choosing a than the low group. Next look at the foils as this can give you a lot of good information. Suppose that for a particular administration of this test we see that eight of the high scoring group and five of the low group had chosen b. If you see this trend over several administrations, you better take a look at that foil for there is something there that is attracting the better students to it. What you should have would be a greater number of the poorer students picking each of the foils.

So, don't analyze just the question and the correct answer but examine the foils also. This is the type of thing that makes tests and measurements interesting; you're always playing with puzzles. Changing one word in a foil, or even changing its position can make a difference.

You will recall that earlier I warned you of the trap of the mathematical syndrome. Again with item analysis, simply because you're working with numbers don't feel that you have precision. I might give the same test item to another class and get fairly different results, so one administration does not prove the value of a test item. If you do this over a period of time and consistently you have an item that comes up with a negative discrimination value, then you ought to discard it. If you consistently find an item that is coming up with a positive discrimination value, you can be more and more sure that it is a good item. Should you consistently come up with an item that shows zero discrimination, then maybe that item is worthless. Although we're working with numbers, remember we don't have real precision. The analysis is a function of the class that you have; it's a function of the size of the group that you have, so take care. These are, though, valuable tools.

Have you come up against the question with true-false tests, of whether or not to correct for guessing? It seems to me that this is based on the untenable assumption that when a student guesses he is doing blind guessing. I think sometimes there may be some subliminal cues operating here. Sure, it's a guess, but an educated guess. It's the same kind of guessing that deans do when they make decisions about budgets and so forth. Decision making under uncertainty is a better term for it. I wouldn't recommend that you go through this business of correcting for guessing unless you're giving a speed test. With a speed test, you make it so long that the whole class can't get through it anyway. You want the class to go as far as they can go, and you want to discourage them from going quickly down the answer sheet and marking the answers in hopes that they hit on a few of them.

I never have been too crazy about true-false tests. On most true-false items, unless they are very skillfully prepared, ambiguities creep in and students are really not sure of what you are asking. I think that as long as there is a fifty-fifty chance of guessing that most people will guess. We may tend to be less of a gambler when we've got one chance in five as with a multiple-choice test. So, I'm never really sure of what I've got after I've graded a paper with true-false items on it. Now, they may serve a useful purpose for the student if it is kind of a diagnostic device, primarily for the students' use, because he knows whether or not he's guessing. I use true-false items, but only to provide some variety.

There are a number of gadgets that allow a student to score himself as he is taking the test; he knows immediately whether he is right or

wrong. Under these circumstances a test can be an excellent learning device. I think we really throw the baby out with the bath water with a lot of our testing, particularly final examinations, which students never see. This is unfortunate.

Typically, this kind of presentation is spread over a whole semester and we get into a lot of detail that we've had to eliminate here. I hope though that we have provided you with some thoughts or ideas that will stimulate your thinking. Tomorrow I'll give you my two-dollar spiel on standard scores.

## SCORING, COMPILING SCORES AND GRADING

Charles Porter[1]

Yesterday, we talked about the purposes for tests, different types of tests and a little about writing test items. Today we will look at some of the things we might do after the test has been given.

Do you all understand the terms mean and standard deviation? Well, let me give you a brief explanation of these statistics as input to understanding and working with test scores. Take some kind of a scale; let's say it's a scale for the height of people. If we would measure a very large sample of people we would find that some are exceedingly short, some are exceedingly tall, but the bulk of them tend to cluster around some central figure. In other words, we get familiar bell-shaped curve as shown in A on the following page. The layman would say we can find the average of these measures as a statistic which indicates the central tendency of these measures. The statistician, and the individual working with tests, would refer to the mean. The mean is found by dividing the sum of all the measures by the number of measures or the "n." It is highly unlikely that we would get this bell, or normal curve, unless we have a very large sample. If the sample is not very large, we might well get what is referred to as a skewed curve. We might have an unusually large number of tall people; in which case the curve would be skewed and might look something like B as seen on the following page. If we have another small sample with an unusually large number of short people, it would be skewed the other way as in C.

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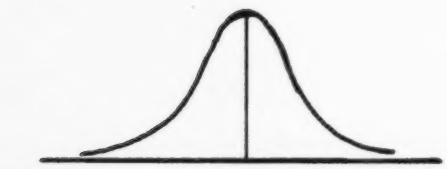
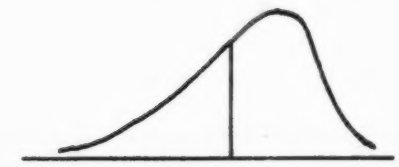
Normal Curve (Bell Shaped)



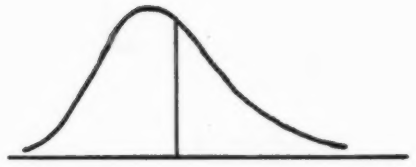

A

Negatively Skewed Curve




B

Positively Skewed Curve




C

There is another property, or statistic, related to a distribution of this type which we need to know. The mean tells us something about a central point around which the scores tend to group, but nothing about their degree of variability. Are they grouped closely around the mean giving a tall narrow curve, or are they spread out in a flat curve? The standard deviation is a statistic which provides us with a measure of the degree of variation among a set of scores. Any statistics, text and most texts on testing, will show you the regular formula and procedures for computing a standard deviation. I will show you a short-cut method which is quite satisfactory to use when working with tests. The standard deviation is equal to two times the sum of the top sixth of the scores minus the sum of the lowest sixth of the scores divided by the number of students.

$$\text{Standard Deviation} = \frac{2 \times \text{Sum of top sixth} - \text{Sum of low sixth}}{\text{Number of Students}}$$

A relatively high standard deviation tells you that your scores are widely distributed, high variability, and a relatively low standard deviation indicates they are grouped closely around the mean, low variability.

With this as a background, let's look at how this is put to use. I have five sets of test scores here for five selected students. They are the kinds of test scores that teachers deal with regularly in their work. I admit they are contrived, but I believe you will see that they make a point. Hopefully they will show you the kind of dilemma you can get into. I hope to show you how to get yourself out of it. Let's suppose that I'm comparing the test scores of five students, who we will call A, B, C, D, and E. You will notice, as shown on the following page, that on the basis of test number one Student E is leading the pack with a 95, and Student A is bringing up the rear. Being knowledgeable people, we recognize the need to give several tests during the semester or whatever the period is. So, we assure Student A not to get all shook up, that this is the first test and he will probably do better on the next test. We give a second test, and the little pep talk to A may have helped because A scored 100 on the second

RAW SCORES

| Student -- | A | B | C | D | E |
|---|---|---|---|---|---|
| Test 1 | 74 | 75 | 80 | 90 | 95 |
| 2 | 100 | 100 | 75 | 95 | 80 |
| Subtotal | 174 | 175 | 155 | 185 | 175 |
| Mean | 87 | 87.5 | 77.5 | 92.5 | 87.5 |

test. Now, when we add the two sets of scores together and compute the mean--the raw score mean--it now appears that Student D is leading the pack and Student C is bringing up the rear.

We give a third test and as you see below all do pretty well.

RAW SCORES

| Student-- | A | B | C | D | E |
|---|---|---|---|---|---|
| Test 3 | 100 | 80 | 95 | 80 | 90 |
| Subtotal | 274 | 255 | 250 | 265 | 265 |
| Mean | 91.3 | 85 | 83.3 | 88.3 | 88.3 |

From the means on the three tests, you'll notice that the lead has changed places again; this time Student A is leading and Student B is bringing up the rear. These are the kinds of things that you have probably observed with your own students. A fourth test is given, the raw score means are figured again, and as you will see below the relative positions have changed again.

RAW SCORES

| Student-- | A | B | C | D | E |
|---|---|---|---|---|---|
| Test 4 | 66 | 95 | 90 | 100 | 100 |
| Subtotal | 340 | 350 | 340 | 365 | 365 |
| Mean | 85 | 87.5 | 85 | 91.25 | 91.25 |

And so we give the final examination which is shown below as test 5. We compute the mean for all five tests for each student and look what has happened. Who's the best student in your class? Who's the poorest? There's really not any way to tell, is there?

RAW SCORES

| Student -- | A | B | C | D | E |
|---|---|---|---|---|---|
| Test 5 | 100 | 90 | 100 | 75 | 75 |
| Total | 440 | 440 | 440 | 440 | 440 |
| Mean | 88 | 88 | 88 | 88 | 88 |

Well, there is something here that I've been doing wrong, and I suspect all of us have been doing it for a long time. I have been making the untenable assumption that all of these tests were equivalent; that they were all equally difficult. Obviously they weren't. I say obviously because if you look at the means and the standard deviations for all students over the five tests, as shown below, it can be seen that they vary considerably.

| Test | Mean | Standard Deviation |
|---|---|---|
| 1 | 75 | 6 |
| 2 | 78 | 20 |
| 3 | 82 | 10 |
| 4 | 66 | 7 |
| 5 | 90 | 16 |

There was considerable difference in means and in the dispersion, or variability, of the scores on the different tests. With a normal curve about 68 percent of the total population will be found within plus or minus one standard deviation of the mean. As we indicated earlier the standard deviation is a measure of the amount of dispersion of measures around the measure of central tendency.

Now, actually the distribution of scores on these tests will not likely be normally distributed. You do not start approaching normality

until you have a couple-of-hundred scores or more. Certainly with the class sizes with which we deal, the distribution will be skewed one way or the other, but for our purposes, as we stated yesterday, we are not going to suffer from the mathematical precision syndrome. We are not going to be "hung-up" if our distributions are not beautifully symmetrical. We are going to make some assumptions that some individuals could argue about, but we will assume that on test #1, since the standard deviation is 6, that about 68 percent of the students that participated in this test have scores that range from 69 on the low side to 81 on the high side; with test #2 we are going to assume that about 68 percent of the class had scores that ranged from 58 to 98.

These tests were on a 100 point scale, so if we look at the means we are inclined to conclude that some were tough, and some were pretty easy. For example, test #4 was a pretty rough test. You will notice that the mean was relatively low for that test and most of the class, some 68 percent, scored between 59 and 73. That was a rough test! As you can see test #5 was fairly easy.

O.K., you say, "So what?" Well, there is a way that we can take into account the level of difficulty of a test so that you can be justified in compiling your scores. We can do this by using the mean and the standard deviation. One of the nice features of this technique is that we don't have to stop and conclude whether this test was more difficult than that one; the process does it for us. The way we do this is to convert raw scores to standard scores. We convert a distribution of raw scores, of which we know very little, to a distribution of standard scores about which we know something. There are several types of standard scores, but I have chosen one known as a T distribution. This standard score distribution always has a mean of 50 and a standard deviation of 10. If you have enough standard scores, they will distribute themselves normally about their measure of central tendency. In converting to standard scores we are taking a number of distributions, individual tests which might vary considerably, and forcing them onto a scale about which we know something.

With raw scores, we can't compare one test very well with another because they are dissimilar. Say a student had an 80 on both test #4 and test #5. We have already shown that test #4 was difficult and test #5 was fairly easy. It was much more of an achievement to score 80 on test #4 than it was to score 80 on test #5. By converting both of these tests to standard scores they can be compared, and compiled to obtain a composite.

How do we convert raw scores to standard scores? Well, again a statistics or test construction text will provide you formulas and the procedures to do this. It is not terribly difficult, but it is

time consuming. The device which I have distributed to you is something I have developed to allow you to make these conversions very quickly.* If you will look at the chart you will see that horizontally through the center is a line of red 50's. Remember, I said that in this distribution the mean is always 50. Look across the top of your scale and you'll see a row of red numbers that are standard deviations. The column of numbers in red, on the over-lay next to the opening represents the possible raw scores. To use this device you follow these steps: (1) arrange test scores in rank order from highest to lowest, (2) compute the mean of the raw scores, (3) compute the standard deviation of the raw scores, (4) align the slot of the over-lay with the column of scores corresponding to the standard deviation of the raw scores, (5) align the raw score mean from the over-lay with the standard score mean of 50, and (6) read the corresponding standard scores opposite the raw score for each of the test scores you have.

(Note: At this point the presenter showed an example of how to use the conversion chart.)

So you see this is a rather simple process, but we have done something which is quite worthwhile. Let's see what converting raw scores to standard scores will do to the five students we looked at earlier. You will remember that in the earlier computation of raw scores all students ended up with overall means of 88. We see in the compilation of standard scores shown below that each has a different mean. We would now have some justification for saying that they did not all do equally well on this series of tests.

STANDARD SCORES

| Student -- | A | B | C | D | E |
|---|---|---|---|---|---|
| Test 1 | 48 | 50 | 58 | 75 | 83 |
| 2 | 61 | 61 | 49 | 59 | 51 |
| 3 | 68 | 48 | 63 | 48 | 58 |
| 4 | 50 | 91 | 84 | 99 | 99 |
| 5 | 56 | 50 | 56 | 41 | 41 |
| Total | 283 | 300 | 310 | 322 | 332 |
| Mean | 56.6 | 60.0 | 62.0 | 64.4 | 66.4 |

*The Standard Score Conversion Chart - Instructional Materials Project #2 is available at a cost of $0.25 from the Illinois State University Foundation, Normal, Illinois 61761

The question may have come to mind of how precise should the standard deviation be. Well, to the nearest .5. That's as close as you can get on the Conversion Chart and it is sufficiently accurate for our purposes in testing.

There are several other features about using standard scores that I ought to discuss. When a student has a test returned with a raw score on it, say a raw score of 77, he really doesn't know how well he has done. He doesn't know how difficult or how easy the test was for the class. But the student who is given his standard score, knowing that 50 is always the mean of standard scores, can tell his relative position in the class. So anybody in the 30's or 40's knows that they need to hustle a little bit, and anybody in the 50's and 60's knows that they are doing fairly well. Once students get used to having test scores reported to them as standard scores they prefer them to raw scores.

Another beauty of standard scores is that they can be weighted legitimately. Suppose you want the final examination to count twice, three times, or ten times as much as any single exam you've given. All you have to do is multiply the standard score by that multiplier and you have a weighted score which is mathematically defensible. Multiplying raw scores by a multiplier is not defensible. Here again, when we are working with numbers, we sometimes think we can do anything with them, and we can't.

You may have wondered what you would do if you had a test of 200 items; the score scale on the Chart only goes to 100. With a 200-item test, you divide everything by 2 and you will get the correct standard scores. Compute mean and the standard deviation, then use half of the mean and half of the standard deviation. Look up one-half each of the raw scores and you'll get the same standard score as if this scale went to 200. You are not limited to a test of 200 or 100, for you can divide by 3 if you want to for a 300-item test.

How many times do you give the same length test? Do you sometimes use a set of 50 items and another time, 100 items, or maybe 10 items? How do you compare a student's performance when giving tests of different lengths? You can't properly do it with raw scores. If you convert those scores to standard scores, then you can compare. You can take a 25-item test, convert to standard scores and compare them to the standard scores a person has received from a 100-item test, a 200-item test, or whatever. By using standard scores you are on mathematically defensible grounds. You will find that converting to standard scores will make little difference on the students at the extremes--the very good and the very poor students. It will though make significant differences in the central area of your distribution.

How about grades? If I had my "druthers," we wouldn't have grading systems. When we have a system of artificial rewards in our educational system, I think it leads to failure. But, we've generally accepted the A, B, C, D and F structure so until we can change it, I guess we'll live with it. Quite frankly, this is one place where I don't have any real good ideas on how you go from the raw scores and standard scores to letter grades. This is a function of the objectives that you set up for your course. I would want to be sure that you had set your objectives in such a way that a person who earns an A in that course really represents excellent performance. I don't want the guy who punctures my arm full of holes trying to find the vein labelled as one of your A students. I want him to be labelled as one of your D or F students. But in some other kinds of training I think we can be satisfied with a little less precision on the part of the performer. When you establish your course, you establish competence levels which determine what constitutes excellence or degrees of performance. It may be that over time you can ascertain that a student must have a standard score average of 58 or higher for A work in this particular course. Anything down to 50, we'll call B, and so on. You might have variable standards depending on the course that you are teaching. If it is a course that requires a high level of skill or there is a possibility of human life being endangered, then I think you ought to set your standards pretty high. On the other hand, if it's routine activities, you may be able to settle for a little lower performance level. I would though challenge you to have some basis on which to make these decisions. So, I don't have any real answers for you on going from standard scores to letter grades. Are there any questions?

(Note: At this point, there was discussion relative to various aspects of the presentation. The statements below are a synthesis of the discussion by the presenter, members of the staff and the participants.)

The use of mastery tests rather than achievement tests may have some real advantages in programs for preparing health occupations personnel. With such tests performance at minimally acceptable levels can be ascertained. Achievement for various individuals or workers may be set at a variety of minimally acceptable levels along a continuum. As roles, usage, and acceptance of workers change, these minimal levels may change over time.

There may be a fallacy in using measured achievement of all objectives as input to the assigning of grades. It may be that certain identified objectives should be achieved at some minimum standard for the individual to pass on to further activities or learnings within the program--as in a go or no-go system. With such a system, each student would be expected to achieve a minimum level of performance on specified, or critical objectives and then grades would be based on the varying degree of achievement on other objectives.

Changing from raw scores to standard scores does not assure that the new distribution, with its mean of 50, is normally distributed and is comparable with the population as a whole. The standard distribution shows how each student compares to each other student who took the test. Therefore, one would not necessarily be justified in assigning grades on a normal curve in the traditional manner, particularly if the group had been selected such that they did not represent a normal distribution, based on general ability or some other such selection criterian.

MODULAR UNIT VI

## The Educational Process

Guidelines:

Educational Objectives

Instructional Strategies

Annotated Bibliography

Supplementary Materials

Micro-experience Analysis Sheet

Supportive Papers:

Orientation to Microteaching -- Lewis Holloway

Microteaching -- Richard Nelson

## EDUCATIONAL OBJECTIVES

6. Following completion of this modular unit, the participant will conduct effective learning experiences.

   6.1 The participant will demonstrate his abilities through micro-experience activities.

      6.1.1 Describes the micro-experience process.

      6.1.2 Recognizes the potentials, and limitations, of the micro-experience process.

      6.1.3 Performs the various roles associated with the micro-experience process.

         6.1.3.1 Prepares appropriate materials for a micro-experience.

         6.1.3.2 Participates in a micro-experience.

         6.1.3.3 Critiques a micro-experience.

         6.1.3.4 Modifies behavior based on the results of a micro-experience.

         6.1.3.5 Operates equipment used to record a micro-experience.

   6.2 The participant will demonstrate his abilities in the classroom or other educational setting.*

* This objective represents how the participant will demonstrate accomplishment of the many objectives contained in these guidelines as that participant operates in the "real world" situation.

## INSTRUCTIONAL STRATEGIES

An example of a micro-experience is seen as an effective way to introduce this modular unit. If video-tape equipment is available showing a tape of such an experience would be most appropriate. This introduction would be followed by a presentation or discussion session to define microteaching, explain how and why it was developed, and some specifics on its use. Attention should be paid to reducing possible anxieties and apprehension which may exist on the part of the participants.

Prior to any formal experiences with making micro-presentations, participants should be afforded an opportunity to have "hands-on" experience with whatever recording equipment will be used and some practice experiences in an unthreatening environment. Video tape recording is highly recommended, but the lack of this equipment should not rule out the use of this process. The participants would be asked to prepare a 3-5 minute session of their own choosing. The presentation would be recorded, replayed and analyzed. This initial experience may be followed by a "re-teach" session if deemed appropriate. When time, equipment and personnel are available, it is beneficial to have the participants have micro-experiences with a variety of educational activities. Although general micro-experiences can be of value, when one is to have a number of opportunities to participate in this type of activity it is suggested that the individual plan to work on specific skills. Microteaching experiences might include teaching to establish set or improving such skills as reinforcement and questioning techniques.

Following the micro-experience activities the participant should attempt to put the techniques learned into practice in regular teaching sessions.

## ANNOTATED BIBLIOGRAPHY

Allen, D. & Ryan, K. Microteaching. Reading, Mass: Addison-Wesley. 1969.

This book by Allen and Ryan is a definitive treatment of microteaching. The authors explain the microteaching concept, how it can be used, and how it has been used. It is an invitation to join in the refinement and evaluation of microteaching procedures.

Bosley, H.E., et al. Video processes in teacher education programs; scope, techniques, and assessment. Multi-State Teacher Education Project, Monograph III. Multi-State Teacher Education Project, Baltimore, Md.: 1968 (ED 025 458).

This document is comprised of five papers on video tape processes which were a part of the Multi-State Teacher Education Project, (M-STEP). Specific programs, general uses and suggestions for implementation are included.

DeTornyay, R. and Searight, M.W. "Micro-teaching in preparing faculty." Nursing Outlook. 1968, 16 (3), Pp. 34-35.

The article is a brief description of the newly implemented pilot project in the use of microteaching to prepare teachers of nursing at the University of California School of Nursing, San Francisco Medical

Center. Results indicate that immediate feedback through videotape recordings and critique sessions helps the student teacher improve her teaching performance, as demonstrated by a comparison in student subject evaluations of the initial and reteach presentations of each skill.

Holloway, L.D. Teacher education institute for new health occupations education teachers. Iowa City, Iowa: Program in Health Occupations Education, The University of Iowa, 1969. (ED)

This final report of a U.S. Office of Education funded study describes a three week short-term teacher education activity for health occupations education teachers. The content covered, instructional activities, and evaluation of the institute are included. The microteaching technique was used as an important part of this activity.

McKnight, P., et al. Microteaching: A description. Amherst, Massachusetts: School of Education, University of Massachusetts, 1968. (Mimeographed.)

Included in this manual are a number of papers and instruments prepared at both the University of Massachusetts and Hartford University. Summer microteaching clinics are described, the purpose of microteaching is explained and the developing of specific teaching skills is covered in some depth.

Perlberg, A., Tinkham, R.A., and Nelson, R.L. The use of portable videotape recorders and micro-teaching techniques to improve instruction in vocational-technical programs in Illinois. Final Report, Urbana, Illinois: Department of Vocational and Technical Education, 1968.

A growing number of educational institutions across the country are investigating the potential interest in the use of portable video recorders and microteaching techniques. This study is one of the first conducted by vocational-technical educators on the adoption of microteaching techniques. The investigation was conducted in two areas: (1) in-service training programs in area vocational schools and the vocational-technical programs of junior colleges and (2) training and supervising student teachers in vocational-technical education. Aspects of each study, the findings and analyses are presented in separate reports. Contains an extensive bibliography on the subject of microteaching.

SUPPLEMENTARY MATERIALS

Micro-Experience Analysis Sheet*
(General Presentations)

Presenter(s) name(s)_____ Observer_____

Type of presentation _____ 1st_____ 2nd_____

Title_____

Objective

Was it clear?

Was it achieved?

Introduction

Was it effective?

Was it appropriate?

Body

Did the strategy fit the objectives and content?

Were examples and instructional media used appropriately?

Was reinforcement used when appropriate?

Were management problems in the situation properly handled?

Were appropriate questioning-response techniques used?

Summary

Were topics reviewed?

Was closure achieved?

Recommendations

*Used for H.O.E. Teacher Education Institute, 1969.

# ORIENTATION TO MICROTEACHING

Lewis D. Holloway[1]

(Note: This presentation began with a short videotape which showed the presenter interviewing a young lady to serve as a student for a microteaching experience.)

What you have just seen was a micro-experience, in this case an interview. Our definition of microteaching is going to be a generic one. For our use it will cover more than just the usual teaching situation. You who are administrators may at times be critiquing teachers, but we want you to also learn that micro-experiences can be used to practice other administrative activities. Although the micro-experience can be used for more than straight teaching the term microteaching is being used in the books and other publications so remember when we use it we mean all experiences of this general nature.

O.K., what do you suppose my first reaction was to the tape you just saw? (Participant: You were probably self-critical.) You'd better believe it! In fact that was supposed to be a practice session for a model tape but we decided to use it rather than to make a second one. It was made about ten o'clock last night, bu[illegible] we didn't quit just because we were tired. Why did we show you a tape which may have been a little hard on my ego? Well, one of my objectives in all this is to encourage you to use microteaching or the micro-experience as an improvement tool. If you saw nothing but polished performances you might be more concerned about being taped yourself. Now you know that even the "prof." is not always real smooth. Some of you have already seen the sample tapes we were showing out in the hall, and I'm going to show some others. These teachers were here last year for our institute. Several did a much better job than I just did. Of course, I'm convinced that I could go back and improve my interview technique. That's the beauty of this procedure.

My second objective was to define microteaching for you. I felt the definition I gave to the student, my oldest daughter, was the weakest part of the tape. Rather than giving you a definition to quote at this point I believe I'll let you develop your own idea of what it's all about as we move along.

Another objective was to have you recognize that this technique is not limited to the teaching field. Also, as I indicated earlier

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[1]Dr. Holloway is, Assistant Professor, Health Occupations Education, College of Medicine, The University of Iowa.

I was interested in helping you to learn to participate without fear. Any anxiety I may have shown was concern for how Lynette would handle her part. As you might expect, she came across better than I did. My final objective was to get across the idea of how you can use microteaching for self improvement. This is the main point that I want you to remember, self improvement.

At this point I would like to make some specific points about this process. Microteaching is a training concept which is real; this is important. Sure, what you saw was contrived, but we were certainly doing more than talking about how to conduct an interview. In another situation I could have really interviewed someone. Next, this procedure is less complex than many techniques. Now you say, "How is it less complex with all that gear?" Remember you can microteach without the recording equipment, and actually this gear really isn't very complex to work with as you will have an opportunity to learn.

The micro-experience allows you to focus on the specific. I wasn't focussing on a specific aspect of the interview, and I think that because of our limited time most of you will probably make general presentations, but you can focus on a specific technique such as questioning or introducing a lesson. Also, this process greatly expands feedback. There are a variety of feedback mechanisms which can be used. It is possible to have the students respond, a critiquing teacher and we can use some kind of a recording device such as the video recorder. A factor of no little importance is that microteaching allows considerable control over variables. This is particularly advantageous in certain types of research.

Techniques like this develop because of a need. Microteaching developed because of poor teaching, or teaching which was less than our best possible efforts. It came primarily, in the form we now know, from Stanford University. Under the leadership of Dwight Allen, who has now moved to the University of Massachussets, a group of educators back in 1962-63 were faced with a particular problem. Their problem was in working with liberal arts students who were working on master of arts in teaching degrees. Because of the state requirements for certification they had to have such preparation. The students weren't very interested in the education courses they had to take and the faculty was looking for some way to show the students that knowing their content wasn't enough preparation to be a good teacher. The first microteaching experiments were contrived situations, in which some of these prospective teachers were set up in situations with students who were cued, or programmed to react in certain ways. In one instance a student always acted as a discipline problem. The student was told that if the teacher would tell him to be quiet that he was to do just that. They also rigged the rooms in different ways, such as to pull the movie screen down in front of the chalk board. As you may have guessed in the teaching situation most of the student teachers kept right on talking while the student caused a disturbance and never

said anything to him. In the case of the movie screen many teachers wrote on the chalk board all around the screen without raising it. All kinds of things like this were used to show the student teachers that there was some need for the materials covered in their methods courses. Eventually they were able to provide play-back as videotape recording equipment became available. They applied for and received federal grants and went on to do real research in the area. The process has been expanded considerably and is now used across the country.

At this point I would like to list some different uses that can be made of the microteaching technique. As far as I'm concerned the most important use is for the improvement of performance. This would be both pre-service and in-service. In the pre-service aspect the goal is to prepare someone to teach or perform who has never done this activity before. The in-service education program is to improve those already in the field. Another important use can be in changing self concepts. One of the things found in the research was that with microteaching changes can be made in both the overly cocky and the timid individual. The cocky person who knows it all, very often is quite surprised to see how he comes across and seeks to improve. The timid person is provided a secure, controlled situation in which to develop his teaching techniques. He can even make presentations without anyone observing until some level of confidence is built.

Microteaching is being used as a valuable research device. We don't know all there is to know about the teaching-learning process, by any means. This is a very good tool for examing various aspects of this process. Another purpose, or use, for microteaching is for evaluation. Are we ready to use this technique to "evaluate teachers"? If we mean are we ready to move into a classroom, make a tape, review it and decide where the teacher should stand on our salary scale, no, we're not ready for that. If it's self-evaluation, if it's for the improvement of the teacher, yes, we're ready.

Allen and Ryan, in their recently published book Microteaching, define a micro-lesson as a three to five minute presentation, generally concerned with only a single skill. These are skills such as questioning technique, motivation, and closure. The term micro-class refers to working with multiple skills, for twenty or twenty-five minutes.

How about the hardware? Well, as we indicated earlier microteaching can be done without any hardware. One can make short presentations to small groups using the microteaching format to some advantage with only your own memory and that of a critiquer for feedback. A great deal of benefit can be gained by use of an audio tape recorder. I have found this to be a good way of improving presentation skills. Of course the videotape recorder as we will use here is, at this point, the ultimate feedback device. It may look like this equipment is very complex, and it is -- internally, but you

will be happy to find that it is quite simple to operate. You will have an opportunity to begin some "hands on" experience with it this evening, if you wish.

Let's take a few minutes right now to look at some examples of health occupations education teachers making micro-presentations.

(Note: The participants were then shown excerpts from several microteaching sessions which had been recorded during the institute the presenter had conducted the previous year.)

The presentations you have just seen were made by individuals with a wide range of experience in teaching. These tapes were made near the end of the time block they spent in microteaching. I believe that all of them made significant improvement in their teaching skills during that time.

Because of our time limitations we will not have an opportunity for everyone to have a great deal of "on-camera time". We would though, very much like to have everyone have some experience with this process. Next week Dick Nelson will be discussing the development of specific teaching skills such as I referred to earlier. Dick will also show you more sophisticated uses of this equipment and will discuss costs, compatability between makes of equipment, etc. Again due our limited time I suspect most of you will want to make more general presentations, though we will be very flexible in an effort to suit your needs. Also don't forget about the possibilities of doing things other than straight teaching. We would ask that you plan your presentations and that you keep them from three to five minutes, unless they are group presentations.

There are a variety of different formats which can be used for presenting and reviewing the tapes. Unless your presentation requires a somewhat different approach we will follow this pattern: (1) presentation of the micro-lesson, (2) reaction by the presenter(s), (3) replay of the videotape, (4) presenter(s) again reacts, (5) "students" react, and (6) the critiquing teacher reacts. We will work in 15 minute segments. This period of time will be scheduled to cover the above activities for each three to five minute presentation.

(Jake Stern: At the risk of beating a dead horse, I would like to add that it is essential that the objectives for the presentations be very clear, very specific. There ought to be somewhere in the process someway of determining whether the objectives have been fulfilled. That, in the final analysis, is the proof of whether the teacher has taught well or not. I don't know exactly how the groups are going to do this, but otherwise it becomes a kind of intuitive evaluation of the teaching task which is what we have been trying to avoid.)

Right, we will have an analysis sheet for use with the micro-presentations. This is one of the things we will react to. Has this person met their objectives? Last year we requested that each presenter submit a lesson plan which specified their objectives. I don't believe we will request that of you, but we want you to communicate your objectives to the group to whom you are presenting. We will have copies of this analysis instrument ready for you the first of next week.

(Participant: "Would you see some type of persuasion activity between an administrator and a group of teachers as being appropriate for this activity?")

Sure, I think it would be great. He could be teaching them, discussing problems, manipulating. It could be an interview or a staff meeting. I don't see many limitations. I see a lot of opportunities.

## MICROTEACHING

Dick Nelson[1]

I will begin by presenting a brief description of the various teaching skills which we worked on in our microteaching project at the University of Illinois. I understand that because of limited time this group is taking a general approach rather than focusing on one skill at a time. The reason we usually focus on one teaching skill at a time is that we don't want to overwhelm the student, or student teacher, with numerous imperfections. We want him to become competent in one before moving on to the next.

Establishing set - the development of a cognitive rapport between teacher and pupil to obtain immediate involvement, the teacher tells what is to be covered and indicates its structure. Establishing rapport with the students was one thing that we found beginning teachers have a hard time doing. They have structured their lesson, they want to teach, and they are going to teach whether the students want to hear it or not. Believe me this happens. The students may have just left PE class, they run in all sweaty and their minds are far from stydying, but this teacher has prepared this lesson, and boy, he's got to cover it. So he starts right in teaching--and gets nowhere. What we are trying to do then in this process of establishing

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[1]Mr. Nelson is, Assistant Professor, Industrial Education and Technology Department, Western Illinois University.

set, is get the teacher to establish rapport with the students, and to let the student know how what is to be covered fits into the total context of the course.

The next skill is recognizing behavior, such as: boredom, comprehension and bewilderment. These are shown through the visual cues of facial expressions, direction of eyes, tilt of head, and body posture. In recognizing behavior, we are dealing with precepts. This is where the videotape, which is not synonymous with microteaching but yet plays a very important part in supplementing microteaching, gives you an accurate feedback. You no longer have to be so worried about preceptions. With the traditional method when a student teacher is out teaching and the supervisor sits in the back row writing all kinds of notes the student teacher is up there saying, "My God, what am I doing so bad that he has so much to write about." So if we have this accurate means of feedback, we do not have to depend entirely on preceptions. What we try to do in working on this skill is to get teachers to recognize behaviors and to continually evaluate their group from the verbal and non-verbal cues.

Next, we go to non-verbal cues. Teachers are often frightened by silence, yet pauses in classroom discussions are good. This is one of the biggest mistakes that teachers make. They will ask a question, and if they don't get the answer that they want immediately, they keep talking. They do not give the students an opportunity to think and to react. Silence is a powerful tool if used correctly.

Frames of reference. A single frame of reference increases student understanding and provides a structure for greater learning. Several frames of reference deepen and broaden that understanding and relate new knowledge to old knowledge. We try to instill in our student teachers the need to use the media, whether it be visual cues, whether it be touch, whether it be models, whatever, to relate new knowledge to old knowledge, so it will become more meaningful. For example, if I say transistor, what do you think of? Radio, electricity? What about size? Small. I may have been thinking about the world's largest transistor that was just developed. You have to put what you're talking about into a frame of reference. You have to identify what you are speaking to.

Next, reinforcement. Desired pupil behavior, positive interpersonal relationship, reward and punishment. What are your reactions to reward and punishment? This is one that, in working with groups, I normally get a lot of reactions to, and I think it is an important part of the educational process. If you look at all individuals, we see functioning and dysfuntioning as they fall somewhere on a continuum. I would suggest that the more disfunctioning a person is, the more negative interpersonal relationships he has experienced. The more functioning an individual is, the more positive the reinforcement

he has had. So the role that we as teachers have to play in many cases is to replace negative interpersonal relationships with positive reinforcement. Yet, stick with the normal distribution curve and say that automatically one-half of our students are going to be below average and we treat them accordingly. Actually, in many cases, we teach maladjustment if you look at it as functioning or dysfunctioning.

Varying the stimulus. Presentation patterns should include teacher movement, gestures, focusing pupil attention, interaction style, pausing, and using different sensory channels. Based on this, the lecture method is probably one of the poorest methods of teaching. Now, that is not to say that it shouldn't be used. It definitely does have its place, but we should use teacher-centered discussions, student discussions, inquiry discussions, or what have you to get the students involved. Many times, we as teachers ask questions and if we don't get the answers that we want, we respond such that we negative condition the students. If we really were to listen to those students, in many cases their answers may be accurate even though we do not immediately perceive them as answers to the questions we thought we had asked.

Next, questioning techniques. The critical requirement for a good classroom question is that it prompts students to use ideas rather than just to memorize. Too often, we in education have asked our students to only memorize what we give them and to give it back to us on a written test. We do the same thing in questioning techniques. We really do not ask questions that will cause them to think. We have a pre-set answer that we expect and don't listen well enough to their answers. Beyond basic questioning we get to higher order questions. We wish to provoke student-initiated questions, and look at cognitive questions which go beyond first answers and to probing questions.

Achieving closure. Closure and set induction work together and are somewhat similar. Achieving closure means more than a quick summary; it pulls together the major points and provides the feeling of achieving. This is a very important aspect of the teaching-learning process. It tells where you are and where you are going and how this fits into the total outline of the course.

Then last, but certainly not least, is evaluation. The videotape is an ideal feedback mechanism for critiquing and self-confrontation. Many individuals will feel threatened by the videotape so if it is going to be effective, it has to be a non-threatening, permissive act. So it may be that you tape the lesson and then allow the individual to evaluate it by himself and erase it. Then as he develops self-confidence, critiques are conducted. We also use an appraisal scale with which our students do an evaluation of the lesson.

This briefly covers the teaching skills sequence that we use at the University of Illinois. They are described in a booklet, that will be available for you at the close of this session.

At this point we will talk about videotape recording equipment. Let me say that I am not interested in selling one kind of equipment over another. I am associated, on a consultant basis, with both the Ampex and Sony Corporations. All individuals involved in our micro-teaching project learned to operate the equipment without any major difficulties. During this project we had an equipment "down time" of only three days for the year, at a cost of roughly $172.00.

There are three basic things that are necessary if you go into using videotape equipment that I would stress. Number one is instructions. This is a must. I agreed with the Sony Corporation and with the Ampex Corporation to write instructions for their new equipment and these should be available within a month. To give you an idea of the type of instructions that are being developed let me indicate to you what was in the instructions we developed for one of the older models. They include an inventory of the equipment, an indication of precautions in using the equipment, identification of all the knobs, and then we go into a step-by-step procedure of how to set up the equipment. We keep this very, very elementary. For example, we start out by saying, "Plug black AC cord into 110 source and connect to outlet box on left end of unit." We keep it on that basis, so if they go step-by-step and follow this they will get good audio and good video, provided the equipment was in working conditions when it was delivered. Then we have a section on how to record, one on playback, disassembling and a section on cleaning the heads.

We have two publications available regarding our project. One for in-service teaching and the other for student teaching. These are obtainable from Mr. Robert Gray, Research Coordination Unit, State Board of Vocational Education and Rehabilitation, Springfield, Illinois. I understand these are listed in your bibliography.

The second basic need, as I see it, to successful use of equipment is to use a system of color-coding. What we mean by color-coding is to use the same color airplane dope on those connectors that go together. The connector on the cable is color-coded, and the connector on the recorder is color-coded. So, unless you're like my good friend Jake Stern, who is color blind, you will get along just fine.

A third need related to the equipment is some type of housing unit. This is essential if you are going to have maximum use of the equipment. There are housing units on the market that are available from most of your manufacturers. At the University of Illinois we developed our own housing units and found them to be quite effective.

(Note: At this point a videotape was shown which demonstrated one of the housing units which had been developed at the University of Illinois. The unit is on wheels and contains all of the equipment necessary for videotape recording.)

This gives you an idea of one type of portable housing unit. Earlier we had developed two others and experimented with them. They are shown in the publications I mentioned earlier. One was similar to the one you just saw only it was constructed such that it lifted apart in the middle so that it could be slid into a station wagon. With the other unit the recorder was carried separately and we built a portable suitcase to carry the other components needed to make it totally operational. In this fashion these two units were transported all over the State of Illinois. The entire unit shown in the videotape cost at $6,000. It contains an Ampex 5100 one-inch recorder; two cameras, with the viewfinders built in; headsets so that we can talk between cameras; a special effects generator so that we can split the screen, vertically, horizontally, and in quardrants; a switcher-fadder that can take care of four cameras and allows us to fade to black, and to superimpose titles; and a 15 watt amplifier-mixer. That figure also includes the materials for building the housing unit, but does not include labor. It is totally self-contained with two zoom lenses. We can roll it anywhere and be ready to go in a very short time.

The Sony unit that you see here including one camera with the viewfinder--the viewfinder on this camera comes separate--a zoom lens, a half-inch recorder and an 18 inch monitor will run roughly $2,400. to $2,600.

The decision as whether you should go to the one-inch or half-inch recorder depends entirely on what you are going to use it for. With the one-inch the line resolution, or quality of the picture, is better because you have 480 lines versus 320 lines. So from this point of view, the one-inch is better. From the point of view of portability, the half-inch is better. I personally prefer the half-inch. I just purchased five sets of half-inch for Western Illinois University for the new project I am going to have there. From my point of view it is hard to justify the difference in cost between one-inch and half-inch. For $895. I can buy this half-inch recorder you see here that is totally automatic. It has automatic gain control, AGC, so that you do not have to set audio levels or video levels. The 5100 Ampex lists for $1,695. and the 7500 lists for a little over $4,000. Ampex should be on the market with a half-inch unit soon. There are pros and cons; it depends entirely on what you are going to use it for. I think, from my point of view, that there is now enough accessories that you can do the job effectively with half-inch tape. The cost of the tape is another matter that has to be taken into consideration. Half-inch tape will run you roughly $27.00 to $29.00 a reel, where one-inch tape will run between $50.00 and $65.00.

(Participant: "How about durability?")

Durability? Well, we hear a lot of verbalization about it, but the only thing that I can go on is the experiences that I have had. I just finished running a two-week seminar on microteaching at the University of Illinois and the equipment was all on loan so that it should have all been in good condition. The half-inch units out-performed the one-inch units and we had less trouble with them.

(Participant: "Because of the types of demonstrations we give there would be an advantage to doing slow and stop motion. Will these units do this?")

The Ampex 7500 here does have normal, slow motion and very slow.

(Participant: "Other than line resolutions are there any other technical differences between the Ampex 5100 and the 7500?")

The 5100 does not have slow motion, stop motion; it is just the basic machine. There is very little difference in the circuitry. Also remember to date all half-inch recorders on the market are made in Japan. One-inch recorders are made stateside. This is where much of the difference comes in.

(Participant: "Is there any discussion going on regarding compatibility between equipment?")

Yes, Ampex has just written specifications for stateside production in one-inch machines. Within two years, this will be accepted and recognized by the federal government and the standard for all manufacturers. Sony Corporation has written specifications for Japanese manufacturers. They have been accepted already, but have not been implemented. It would appear that they will be implemented next spring, so that there will be standardization or compatibility. This has been a big problem; compatibility between the same manufacturer has been a big problem, but you can compensate for this to some extent.

(Participant: "What about service if one might need it?")

It depends on what kind of service you are talking about. If you mean one-day service, yes, you might have a problem. Problems with service can be used as an excuse for not purchasing the equipment. I'm sure that if you have someone teaching electronics in your school and you buy the manuals with the equipment that he will be able to fix 90 percent of your problems. I'm a union carpenter by trade and yet I work on this gear all the time.

(Participant: "Is it better to have portable or stationary equipment?")

There are mixed feelings on this. I would recommend very seriously that it be portable. When you make this kind of outlay, you want maximum use. It seems logical to me that if you are going to have maximum use of it, the more portable it is the more it's going to be used. We tried taking students and the teacher into a studio. It didn't work; it's a foreign environment. So, instead of doing this we take the equipment to the students, to the class. Now there are some problems. Students are like machines, they like to see themselves. Therefore, right at the beginning we let them go in front of the camera, look at themselves, play it back, and let them get it out of their system. Then we are ready to get down and start working. It's surprising how they become accustomed to it. I will not say, as one of my colleagues will, that the students completely forget the equipment after five minutes. I will say that after the first time it's used they will hardly be aware of it.

(Participant: "Would you care to say anything about what you do with the tapes after you've got them made? The problems of how to be selective, what to keep, what not to keep, how to retrieve them, how to store them, etc.")

Say we make a tape in this workshop and we wanted to take portions of that tape that we felt were excellent and develop a model tape, this can be done electronically with any of the units. This is the process of dubbing, whereby you would select just those parts of a tape, or several tapes, and dub them onto the model tape.

Then the process of labelling. It is important that you keep an accurate account of what is on each tape you have. If you use it again, you've lost what you had. We used record sheets on which we indicate the "footage" at which all portions start and stop. Now, as far as storage the one thing that I would strongly encourage is that under no circumstances should you store the tapes in steel cabinets. Store them in wooden cabinets. It's just like a computer tape. You drop it, you're going to lose a lot of your picture; you run a magnet over it, you have lost it all. The shelf life expectancy of magnetic tape is roughly 7-10 years. The life expectancy for use--this is for maximum quality that I am speaking of--is between 210 and 310 showings.

(Participant: "Will special lighting affect the quality of the picture?")

Definitely. It is not a necessity, but it does help a lot in terms of the quality of the picture. You do though have to adjust the video level. The quality will depend on where you pick up your shadows, where you place your lights. Having lights and just turning them on doesn't do the job. You have to have some idea of where to place them.

Besides using this equipment for microteaching there are many, many other possibilities. For instance there are attachments for the camera by which you can set up what you want to look at in a microscope and actually tape what can be seen in the microscope. In this way many can see what the instructor would have them see without each having to set up their own microscope.

Another use could be for the surveillance of students in a multiple activity session such as a laboratory. Considerable use has been made where you have only one piece of equipment and where all could normally not see it at once. Multiple monitors can be used with a single camera. This is particularly helpful when showing small objects, where there are large audiences, or where sterile conditions must be maintained. An effective use in the guidance and counselling field is to go out with the portable unit and record people in the community doing various activities to show students as a part of a vocational guidance activity.

(Participant: "How much more expensive is it with color?")

Effective yes, but prohibitive. The cheapest converger is $50,000. Within two years the Sony Corporation has said they will have a color system on the market for under $10,000. Remember one thing, this equipment was not developed for education, but for use in the home to tape broadcast programs. As it turns out the educational market has gone wild and the manufacturers can't keep up.

At this point I would like to show you some of this equipment and how it operates.

(Note: The presenter demonstrated and discussed the use of the videotape recording equipment and particularly a special effects generator and a portable battery-pack camera and recorder.)